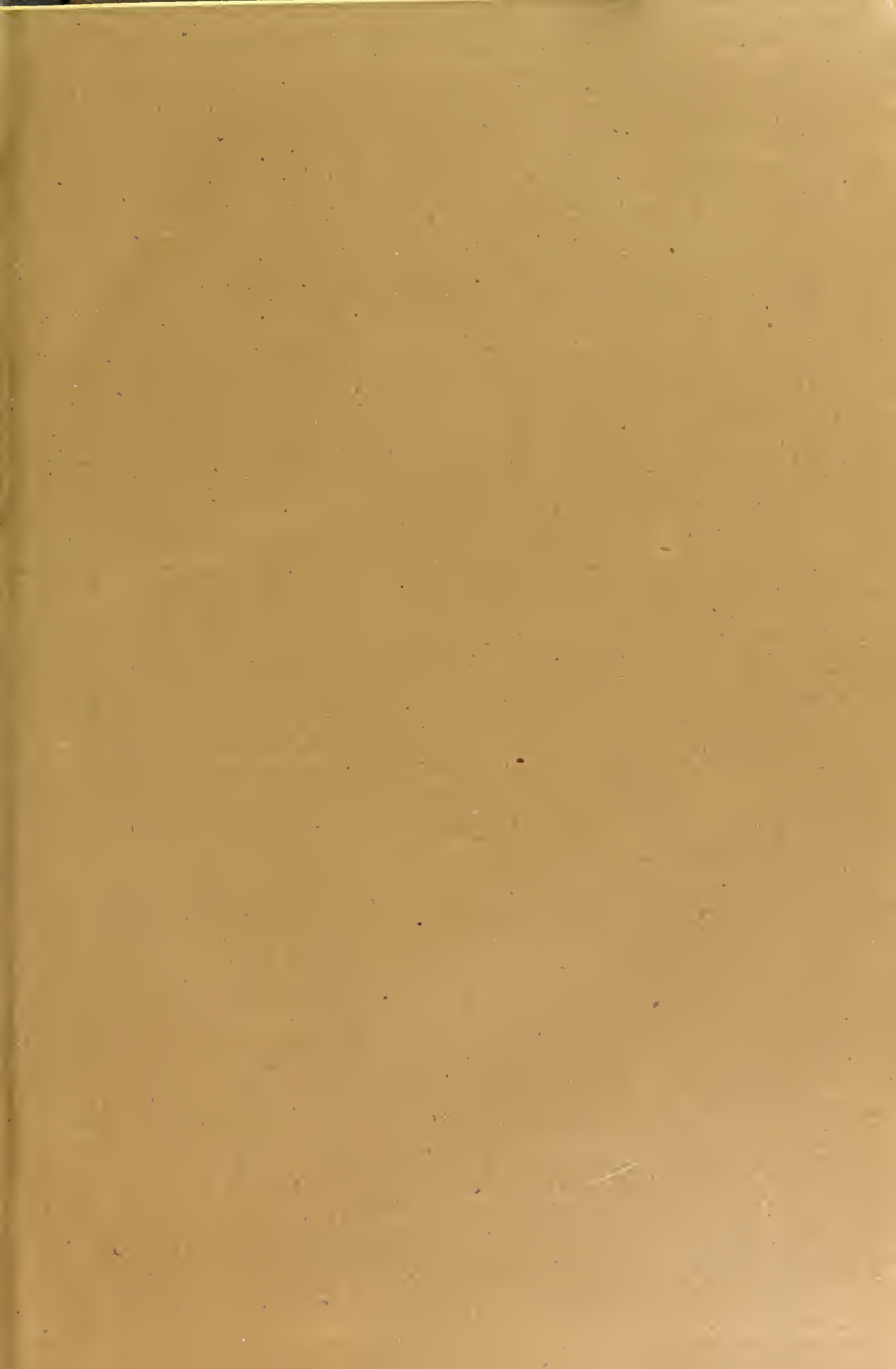


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PROCEEDINGS  
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MEDICAL SOCIETY.

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VOLUME VIII.

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*SESSION OF 1887.*



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 RICKARDS, WM. M. L., 601 N. 17th.  
 RISLEY, SAMUEL D., 1722 Walnut.  
 RIVELY, M. P., 839 N. 24th.  
 ROBERTS, A. S., 255 S. 16th.  
 ROBERTS, JOHN B., 1627 Walnut.  
 ROBINS, ROBERT P., 2024 Locust.  
 ROBINSON, WM. D., 2100 Mt. Vernon.  
 RODERER, JOHN F., 1338 N. 4th.  
 ROSENTHAL, EDW., 517 Pine.  
 ROUSSEL, ALBERT E., 2210 Pine.  
 RUDDEROW, BENJ. J., 525 N. 19th.  
 RUNKLE, W. V., 2003 Christian.  
  
 SAJOUS, CHAS. E., 1630 Chestnut.  
 SALINGER, JULIUS L., 947 Franklin.  
 SANTEE, EUGENE I., 605 N. 11th.  
 SCHAFFER, CHAS., 1309 Ach.  
 SCHIEDT, PHILIP M., 1923 N. 6th.  
 SCHNEIDEMAN, T. B., 1609 Franklin.  
 SCHOALES, JOS. D., 1428 N. 11th.  
 SCHOTT, ARNOLD, 1224 N. 7th.  
 SCHWEINITZ, GEO. DE, 1330 Spruce.  
 SCHWENK, P. N. K., 606 Marshall.  
 SEILER, CARL, 1346 Spruce.  
 SEISS, RALPH W., 49 N. 17th.  
  
 SELTZER, C. JAY, 22 S. 16th.  
 SELTZER, CHAS. M., 608 N. 17th.  
 SHAKESPEARE, E. O., 1336 Spruce.  
 SHAPLEIGH, ELISHA B., 658 N. 8th.  
 SHEETS, JOHN, 1324 Spring Garden.  
 SHELLENBERGER, J. R., 4783 Ger-  
     mantown Ave.  
 SHIMWELL, B. Y., 1253 S. 17th,  
 SHOBER, J. B., Pennsylvania Hospital.  
 SHOEMAKER, GEO. E., 3727 Chestnut.  
 SHOEMAKER, JOHN V., 1519 Walnut.  
 SHRINER, T., 2404 Frankford Ave.  
 SINES, J. HENRY C., 2033 Chestnut.  
 SIMSOHN, JOSEPH S., 835 N. 8th.  
 SINEXON, JUSTUS, 751 N. 20th.  
 SINKLER, WHARTON, 1534 Pine.  
 SKILLERN, P. G., 427 S. Broad.  
 SKILLING, M. J., 1702 Christian.  
 SLOCUM, HARRIS A., 1208 Spruce.  
 SMALTZ, J. HENRY, 801 N. 6th.  
 SMITH, A. D., 5067 Germantown Ave.  
 SMITH, HENRY H., 1800 Spruce.  
 SMOCK, L. P., 3330 Chestnut.  
 SPARKS, GEO. W., 635 Spruce.  
 STEINBACH, L. W., 716 Franklin.  
 STELWAGON, H. W., 1411 Spruce.  
 STERN, MAX J., 943 N. 8th.  
 STEWART, DAVID D., 2628 N. 5th.  
 STEWART, FRANCIS E., 721 S. 22d.  
 STEWART, WM. S., 1801 Arch.  
 STILLÉ, ALFRED, 3900 Spruce.  
 STINE, LUTHER K., 1502 N. 4th.  
 STOCKER, A. E., 2212 Fitzwater.  
 STONE, EDWARD R., 1539 N. 19th.  
 STONE, JAMES F., 1806 Green.  
 STRAWBRIDGE, GEO., 1500 Walnut.  
 STRITMATTER, I. P., 1232 N. 5th.  
 STROBEL JOHN, 1134 N. 30th.  
 STUBBS, G. EASTMAN, 1616 Walnut.  
 STYER, C., 2201 Columbia Ave.  
  
 TAYLOR, J. HOWARD, 1133 Spruce.  
 TAYLOR, J. MADISON, 331 S. 16th.  
 TAYLOR, WM. J., 331 S. 16th.  
 TAYLOR, WM. L., 1440 N. 12th.  
 THOMAS, CHAS. H., 1807 Chestnut.  
 THOMAS, FRANK W., Mount Airy.  
 THOMSON, WM., 1426 Walnut.  
 TRAUTMANN, B., 529 N. 4th.



- TREACY, DENNIS J., 1914 Christian.  
 TROTH, SAMUEL W., 2043 Franklin.  
 TROTTER, SPENCER, 223 S. 18th.  
 TULL, M. G., 4807 Woodland Ave.  
 TURNBULL, CHAS. S., 1719 Chestnut.  
 TURNBULL, L., 1502 Walnut.  
 TURNER, JOHN B., 724 S. 16th.  
 TYSON, JAMES, 1506 Spruce.
- VANDERSLICE, E. S., 127 S. 5th.  
 VANDYKE, EDWARD B., 306 S. 10th.  
 VAN HARLINGEN, A., 118 S. 17th.  
 VOGLER, GEO. W., 565 N. 5th.
- WALK, JAMES W., 748 N. 20th.  
 WALKER, JAMES B., 1617 Green.  
 WATSON, ARTHUR W., 1706 Walnut.  
 WATSON, EDW. W., 131 N. 20th.  
 WAUGH, WM. F., 1725 Arch.  
 WEBB, WM. H., 556 N. 16th.  
 WEHNER, J. H., 156 Wister, G'ntown.  
 WEIR, F. LE S., 810 E. Thompson.  
 WELCH, WM. M., 821 N. Broad.  
 WELLS, J. R., 5138 Lancaster Ave.  
 WHARTON, H. R., 1405 Locust.  
 WHEELER, E. B., 1926 N. 8th.  
 WHELEN, ALFRED, 123 S. 20th.  
 WHITE, J. W., 1810 S. Rittenhouse Sq.  
 WHITESIDE, J. E., 6603 Haverf'd Av.  
 WIEHLE, C. A. MAX, 319 N. 32d.
- WIGHTMAN, J. G., 1639 Race.  
 WILEY, EUGENE, 330 Reed.  
 WILLARD, DE F., 1818 Chestnut.  
 WILLIAMS, HORACE, 1717 Pine.  
 WILLITS, CHAS. H., 1839 Arch.  
 WILLITS, I. P., 5123 Germant'n Ave.  
 WILSON, B. B., 1903 Chestnut.  
 WILSON, C. MEIGS, 121 S. 17th.  
 WILSON, ELLWOOD, 1517 Walnut.  
 WILSON, H. AUGUSTUS, 1611 Spruce.  
 WILSON, JAMES C., 1437 Walnut.  
 WILSON, JAMES F., 1010 Race.  
 WIRGMAN, CHAS., 2005 Pine.  
 WISE, GEO. G., 424 S. Broad.  
 WITTIG, CHAS. F., 450 N. 4th.  
 WOLFF, LAWRENCE, 333 S. 12th.  
 WOLFORD, W. S., 1310 Walnut.  
 WOOD, HORATIO C., 1925 Chestnut.  
 WOODBURY, FRANK, 218 S. 16th.  
 WOODS, D. F., 1501 Spruce.
- YARD, JOHN L., 1608 N. 12th.  
 YARROW, THOMAS J., 1335 N. Broad.  
 YOUNG, I. G., 1000 Shackamaxon.  
 YOUNG, J. K., 222 S. 16th.
- ZIEGLER, GEO. J., 123 Richmond.  
 ZIEGLER, W. M. L., 2007 Col'bia Ave.  
 ZIEGLER, WM. H., 2710 Richmond.  
 ZUILL, W. L., 1825 Race.

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## DECEASED MEMBERS.

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- AUSTIN FLINT, SR., (Honorary),  
 March 13, 1887.
- WILLIAM R. CRUCE, Aug. 15, 1886.  
 DAVID DAVIDSON, July 14, 1887.  
 WM. HARKINS FOX, May 13, 1887.  
 GEORGE HAMILTON, Oct. 30, 1885.  
 HENRY D. HARVEY, Nov. 29, 1887.  
 NATHAN HATFIELD, Jan. 4, 1887.  
 NATHAN L. HATFIELD, Aug. 30, 1887.  
 EDGAR P. JEFFRIES, May 25, 1887.
- WILLIAM S. LITTLE, Feb. 17, 1887.  
 R. M. McCLELLAND, Feb. 16, 1887.  
 ANDREW NEBINGER, April 12, 1886.  
 CLAUDIUS R. PRALL, Dec. 8, 1885.  
 N. ARCHER RANDOLPH, Aug. 21, 1887.  
 ELLIOT RICHARDSON, May 9, 1887.  
 JOSEPH G. RICHARDSON, Nov. 13, 1886.  
 ALBERT H. SMITH, Dec. 14, 1885.  
 WM. TERRY TAYLOR, March 2, 1887.

## ADDENDA.

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APPLEMAN, P., 1106 Arch.

KIRKPATRICK, A. B., 511 Brown.

SKILLERN, SAMUEL R., 3509 Baring.

WEED, C. L., 1804 Green.



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## PAPERS NOT PUBLISHED IN THE PROCEEDINGS.

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THE preceding volume included papers read before the Society prior to June 30, 1885; from that date to January 1, 1887, the proceedings were not published. The following is a list of the papers, specimens, and apparatus presented during the interim; with the places and dates of their publication, so far as these have been ascertained.

September 9, 1885. The Treatment of Hysteria. Chas. K. Mills. *Polyclinic*, October, 1885. A New Form of Galvanic Battery, and a Milliampèremeter. Chas. K. Mills.

September 16, 1885. A Fatal Case of Myoma of the Uterus, with Microscopic Specimens. J. M. Anders.

Demonstration of a Bandage for Fracture of the Clavicle. Chas. W. Dulles.

Observations on Death by Lightning, by Henry Beates; with Record of Autopsy, by H. F. Formad.

September 23, 1885. A Case of Cæsarean Section. W. H. Parish.

A Report of Six Hundred Cases of Labor. H. Leaman. *Philadelphia Medical Times*, October 3, 1885.

October 14, 1885. Removal of the Uterine Appendages. W. H. Parish. *Philadelphia Medical Times*, January 23, 1886.

October 21, 1885. Specimens of Pericarditis. H. F. Formad.

A Mummified Fœtus Concurrent with an otherwise Normal Delivery of a Healthy Child. J. E. Whiteside.

A Unique Specimen from a Case of Intestinal Traumatism, with Remarks. Henry Beates.

A Case of Uleerative Endocarditis. W. E. Hughes. *Polyclinic*, Nov., 1885.

Cases of Aspiration of the Bladder, and Intussusception. Chas. Wirgman. *Polyclinic*, November, 1885.

Case of Endo-pericarditis. T. V. Crandall. *Polyclinic*, November, 1885.

October 28, 1885. Some Points in the Management of Labor. E. E. Montgomery. *Polyclinic*, December, 1885.

November 11, 1885. The Treatment of Certain Forms of Chronic Malarial Disorders. S. Solis-Cohen. *Polyclinic*, January, 1886.

November 18, 1885. Case of Rupture of the Perineum extending through the Recto-vaginal Septum, with successful Operation. M. Priece.

Laparotomy for Concealed Hernia, with Malformation of the Sigmoid Flexure. Dr F. Willard. *Polyclinic*, December, 1885.

Remarks on the Classification of the Various Forms of Alcoholism—a Brief Study in Nosology. James C. Wilson. *Polyclinic*, December, 1885.

- Case of Abscess of the Liver, with Specimen. Wm. Ziegler.  
November 25, 1885. Typhoid Fever in Philadelphia. H. Leffmann.  
*Polyclinic*, March, 1886.
- December 9, 1885. The Clinical Treatment of Pulmonary Consumption.  
J. C. Wilson. *Philadelphia Medical Times*, December 26, 1885.
- Artificial Climatic Effects for Stay-at-homes. S. Solis-Cohen. *Philadelphia Medical Times*, February 6, 1886.
- December 16, 1885. Illustrations of Ohm's Law by the Graphic Method.  
G. Betton Massey.
- Glass Drainage Tubes to be used for the Abdominal Cavity. John C. Packard.
- A Clinical Note on Antipyrin. Wm. H. Welch. *The Medical News*, January 2, 1886.
- Valvular Heart Disease, with Hypertrophy, and Pericarditis with Unusual Symptoms, with Specimens. Joseph S. Neff.
- December 23, 1885. Palmar Abscess, Panaris (Whitlow), and other Affections of the Hand. G. G. Davis.
- January 13, 1886. The Treatment of Hydrophobia, with especial reference to Pasteur's Method. Chas. W. Dulles. *Medical Record*, February 13, 1886.
- January 20, 1886. Aphasia with Hemiplegia, Hemianæsthesia, Hemianopsia, Amblyopia, and Loss of Taste, Smell, and Hearing on the Affected Side. H. C. Wood. *Polyclinic*, February, 1886, and *Philadelphia Medical Times*, March 6, 1886.
- Remarks on Syphilitic Disease of the Lungs. E. T. Bruen. *The Medical News*, March 20, 1886.
- Notes on Miliary Syphilitic Gummata of the Lung, with Microscopic Specimens. J. H. Musser.
- January 27, 1886. Pyridine in the Treatment of Asthma. J. S. Neff.
- Specimen of Phenol-phthaline, with Remarks on its use as a Test for Alkalies. J. S. Neff.
- Natural Labor and its Management. Wm. T. Taylor. *Philadelphia Medical Times*, April 3, 1886.
- February 11, 1886. On the Suppression of Illegal Practice in Philadelphia. J. F. Edwards.
- February 17, 1886. An Expedient for the Immediate Improvement of the Water Supply of Philadelphia. Chas. H. Thomas.
- Specimen of Aneurism of the Aorta. J. S. Neff.
- February 24, 1886. Southern Florida as a Winter Sanitarium. W. A. Edwards. *Philadelphia Medical Times*, March 6, 1886.
- The Anatomical Relations of the Arteries, Nerves, and Veins of the Principal Articulations. O. H. Allis.
- March 10, 1886. A Plea for the Necessity for a Common Standard for the Artificial Feeding of Infants. A. V. Meigs.
- A Case of Perityphlitic Abscess Treated by Incision and Drainage. H. R. Wharton.
- April 14, 1886. The Drainage Problem in Philadelphia. J. F. Edwards.
- April 21, 1886. Intestinal Obstruction. John Ashhurst, Jr. *Polyclinic*, May, 1886.
- April 28, 1886. Ophthalmoscopic Examinations of the Insane at the State

Hospital, Norristown, and the Insane Department of the Philadelphia Hospital. *Philadelphia Medical Times*, July 10, 1886.

May 12, 1886. The Treatment of Fracture of the Lower End of the Radius, with Results. J. B. Roberts. *Polyclinic*, May, 1886.

May 19, 1886. Saccharin. L. Wolff. *Therapeutic Gazette*, July, 1886.

Specimen of Congenital Hydrocephalus. E. Rosenthal. May 26, 1886.

The Value of Eucalyptus in Intermittent Fever. J. H. Musser.

June 9, 1886. Eserine in Diseases of the Eye. H. F. Hansell. *Polyclinic*, June, 1886.

June 23, 1886. The Care of the Eyes in Institutions for Children. Wm. S. Little. *Polyclinic*, July, 1886.

September 8, 1886. Remarks on the Prevention of Scrivener's Palsy, or Writer's Cramp. F. Woodbury.

Six Consecutive Cases of Pyosalpinx. J. Prie. *New York Medical Journal*, October 23, 1886.

October 13, 1886. The Use of Arsenic in Anæmia. Wm. Osler.

Observations during Two Years' Residence at Colorado Springs. *Polyclinic*, October, 1886.

The Malarial Germ of Laveran; Specimens. Wm. Osler.

October 20, 1886. Gangrene of the Lung, with Specimen. J. H. Musser. *Polyclinic*, November, 1886.

Specimens of Extrauterine Pregnancy. H. F. Formad.

A Unique Case of Injury to the Ear. L. J. Lautenbach. *Polyclinic*, November, 1886.

October 27, 1886. Electrolysis; with especial Reference to its Trial in Inflammatory Products in the Female Pelvis. J. H. Lloyd. *Polyclinic*, November, 1886.

November 10, 1886. Some Causes of Pulmonary Consumption, as Viewed from a Darwinian Standpoint. T. J. Mays. *The Medical News*, November, 27, 1886.

November 17, 1886. A Case of Peritonitis in Enteric Fever, Terminating in Recovery. J. C. Wilson. *Philadelphia Medical Times*, December 11, 1886.

Duodenal Ulcer, Clinical and Anatomical Considerations, Based on Nine Cases. Wm. Osler.

November 24, 1886. The Contagiousness of Scarlet Fever. A. V. Meigs. *Medical Record*, December 11, 1886.

December 8, 1886. Pneumato-therapy. S. Solis-Cohen. *Therapeutic Gazette*, January, 1887.

December 15, 1886. Specimen of Sarcoma of the Leg. J. B. Deaver.

Demonstration of Intubation of the Larynx. Carl Seiler.

Pyelo-nephritis. E. T. Bruen.

Lymph Scrotum. Dr. Fryer.

Fibrous Subcutaneous Nodules following Subacute Rheumatism. J. K. Mitchell.

December 23, 1886. Recent Specimen of Hypertrophy of the Heart, with Mitral Insufficiency. E. T. Bruen.

Ethyl Bromide as an Anæsthetic, and Specimen of Hydrogen Peroxide. L. Turnbull. *Medical and Surgical Reporter*, January 22, 1887.



January 26, 1887. Eleven Consecutive Cases of Abdominal Section. J. Price. *New York Medical Journal*, March 5, 1887.

February 23, 1887. The Non-contagiousness of Pulmonary Tuberculosis. T. J. Mays. *Therapeutic Gazette*, March, 1887.

April 27 1887. Apparatus for Administering Ether. J. S. Miller.

May 11, 1887. Features Characterizing the Present Epidemic of Measles in Philadelphia. Chas. Baum.

June 22, 1887. Base-ball Pitchers' Arm. A. H. P. Leuf. *The Medical News*, July 16, 1887.

September 14, 1887. Clinical Analysis of Sixty-four Cases of Poisoning by Lead Chromate. D. D. Stewart. *The Medical News*, December 31, 1887.

November 23, 1887. Two Cases of Aneurism in Girls, with List of Reported Cases under Twenty Years of Age. W. W. Keen. *The Medical News*, December 24, 1887.

# REMARKS ON THE USE OF WHALEBONE BOUGIES IN THE TREATMENT OF URETHRAL STRICTURE.

By J. H. BRINTON, M.D.

[Made January 12, 1887.]

I PROPOSE, for a few moments, to ask the attention of the Society to some points in the application of filiform bougies to the treatment of urethral stricture, although it is not my purpose to institute any comparison between other modes of treatment and that of which I shall speak. I wish merely to refer to the process of rapid dilatation, effected in the course of a few minutes, by the introduction of stretching instruments, the employment of which is preceded and accompanied by the use of filiform bougies. When these latter were first introduced they were warmly welcomed, but I think that of late some disappointment has been felt in regard to their efficiency, a disappointment which, however, I do not share. I believe that in these instruments we have an efficient mode of treating stricture, provided they be properly constructed, and skilfully manipulated.

As I have never been quite satisfied with the whalebone filiforms of the shops, I have for some years been in the habit of making my own, and with these I have experienced comparatively little difficulty in treating stricture, and in relieving obstinate cases of retention. My experience has convinced me that all organic urethral strictures of non-traumatic origin are pervious to the filiform bougie, patiently and systematically essayed, and this is the essential and starting-point in the treatment which I prefer.

In making my bougies I purchase the material from a dealer in New York.<sup>1</sup> These long, slender, rounded whalebones of various thicknesses are articles of commerce and are used for many purposes in the arts. They are rounded through a drawplate, and come in lengths of twenty-seven or twenty-eight inches, costing about two dollars a gross.

<sup>1</sup> Joseph F. Tobin, 82 Duane St., N. Y.

Each piece will make two bougies. In preparing them I first cut off the end transversely so as to get rid of any tendency to split. I then round the end by rubbing it lightly on a sheet of emery-paper gummed upon a board. I then make the extremity bulb-shaped. I am told that the bulb is usually produced by the action of a file. This, I think, is objectionable, as it impairs the fibre of the bone, and renders it liable to break or cut when metallic instruments are slid down over it. I make the bulb extremity by placing the end of the whalebone in a groove on the board and shave or scrape it from the end with a very sharp knife. I then shave down the shank and neck in like manner in the opposite direction, until I have formed a conical neck from three to four inches long and of almost capillary thickness as it approaches the bulb. The shaping of the bulbar end demands some dexterity in handling the knife, and to insure accuracy I do this under a lens of low power. Having shaped the filiform with the knife, it may, if desired, be yet more smoothed by being rubbed laterally on the emery board. In case cylindrical whalebone cannot be obtained from the manufacturers, the irregular strips may be readily rounded by being passed through a watchmaker's drawplate, or wire gauge. As the filiform whalebone bougie is the guide upon or over which metallic instruments are to be passed, each one should be carefully fitted. This can be done by frequently passing it upward and downward through the tunnelled perforation in the beak or extremity of each and every instrument, in conjunction with which it may in future be used. This may seem a small matter, but, in fact, the harmonious action of the guide bougie and its metallic companion has much to do in effecting a ready passage of a strictured point. [The speaker here illustrated the process of constructing the bougie.] After using one of these instruments, should the neck become bent or twisted, I place it for a moment in hot water and then press it between the leaves of a book.

In endeavoring to pass a stricture I make the first attempt with a single whalebone: if it passes, well and good. If it does not go through, I follow it with others, perhaps five or six, until the follicles or folds of the mucous membrane near the stricture are occupied. Then by patiently essaying the inserted filiforms, I almost always succeed in getting beyond the stricture at the first sitting. Sometimes, although very rarely, and in non-urgent cases, if great difficulty be encountered at the first trial, and the patient be frightened and irritable, it may be advisable to desist for the day, and to make a subsequent second attempt. Success at the first trial is, however, the rule, if the

instruments be well made, and the efforts be gentle. There is, however, a caution to be observed as to the time of making use of filiform instruments. Their application, in cases of tight stricture, should be primary—I mean that one cannot expect to succeed with them if they have been preceded on the same day by the attempted introduction of round-ended instruments, the tendency of which undoubtedly is to obscure or close in some way the narrow opening of a resisting stricture, and thus to render its detection more than usually difficult. I may add here that I always use the straight filiform.

The whalebone, when once introduced, serves as a guide to the metallic catheter, or stretching instrument. This may be the tunnelled catheter, or any of the various forms of dilators or divulsors; preferably, I think, that of Sir Henry Thompson, followed by this powerful and most efficient instrument designed by Prof. S. W. Gross, and which registers from 16 to 40 of the French scale.

In using metallic instruments in conjunction with the filiforms, there is one point to which, I think, attention has not been directed. We are ordinarily told to slide the metallic instrument over the whalebone through the stricture into the bladder; in so doing, the whalebone may be cut at the seat of stricture. I have often heard of this accident, and I have seen it happen. I avoid it in this manner: Having passed the whalebone into the bladder, I carry the metallic instrument—threaded on it, as it were—down until I reach the stricture, the point of resistance. I then cease to push the metallic instrument along the filiform, but slightly withdrawing the latter to gain a little by its conicity, I grasp firmly both instruments between my thumb and finger, and gently carry them on together. In this way I am almost certain to pass the resisting point, and, if the stricture be single, to reach the bladder. I speak on this matter somewhat positively, since I have used these instruments largely, and cannot, for many years, recall a case which I have failed to pass in the manner described.

In employing the stretching instrument I usually separate the blades as far as No. 30 or No. 35 of the French scale, and on its withdrawal, introduce a steel bougie of about the same calibre, to see that all is right and that the urethra is clear. The bougie is then removed and is not reintroduced until the third or fourth day. The after-treatment consists in the hypodermic use of morphia, etc., full doses of quinine, and in a milk diet.

In retention dependent upon tight and irritable stricture, not readily overcome by the catheter, I have often succeeded by simply



passing a whalebone into the bladder and leaving it *in situ*. The urine will readily pass along the filiform by capillary action, and the steady dribbling thus established will in a short time empty the bladder. The presence of the whalebone serves also to render the stricture less tight, and so facilitates the after-passage of metallic instruments should their use be considered desirable.

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## DISCUSSION.

DR. S. W. GROSS said: I take it that Dr. Brinton has confined his remarks to the treatment of very tight strictures. I think that the younger members of the profession, who are not much accustomed to the use of filiform bougies, ought to be told not to put too much confidence in them. The filiform bougie does not pass with a great degree of readiness through a small stricture or even through a large one in all cases. I differ from the speaker in regard to the usefulness of the twisted bougies. In the great majority of strictures, the orifice is eccentric. A twisted bougie will often pass after we have failed to pass a straight bougie, although the urethra has been packed with them.

We know that in cases of stricture not the result of traumatism, the obstruction does not arise from the organic stricture itself. A man may have been suffering with stricture for some time, and the calibre of the urethra have been gradually narrowing until the stream of urine becomes very small. In this condition he exposes himself to cold and wet, and in the course of a few hours is unable to pass urine. In such a case the obstruction is not due directly to the organic stricture, but there is superadded spasm of the muscles of the urethra, and it is spasm which we have to overcome rather than the coarctation itself. In such a case, the patient being under the influence of an anæsthetic, I carry a medium-sized instrument, say one whose shaft measures No. 16 and whose point is No. 13 of the French scale, down to the stricture, supporting, if necessary, the curve of the instrument with the finger on the perineum or in the rectum. In the majority of cases gentle pressure for a few minutes will enable the instrument to pass into the bladder. I have succeeded in this way in cases where I have failed to introduce a filiform bougie. A convenient way of passing the filiform bougies is first to pass into the urethra to the seat of stricture a short metallic tube, and then carry the whalebone bougies through this tube.

I have met with the difficulties referred to in the manufacture of the whalebone bougie. The cutting of the bougie is often due to the instrument which passes over it. The eye is at times so sharp that it strips up the whalebone. Care should be taken to see that the opening is well rounded.

In the operation described by Dr. Brinton, which is the one to be used if it is so desired in these cases, it is always well after passing the coarctation and relieving the retention, to bring the urethra up to a certain calibre, and that is another point in the treatment of stricture. How shall we know to what

extent we shall divulse or incise a stricture? The operation described to-night is really that of divulsion. I had to-day at my clinic a case in point. It was that of a young man from a distance. He was etherized, and in order to determine to what extent the stricture should be cut or dilated, I introduced into the urethra the urethrometer, with which we can measure the capacity of the urethra. In this case there were two strictures. Immediately in front of the first, which was six and one-fourth inches from the meatus, the urethra had a capacity of No. 31. In such a case, as the stricture always shows a tendency to contract, it is well to cut or rupture it to No. 34 or 35, to allow for the subsequent contraction.

The instrument to which Dr. Brinton has referred, I had made more particularly for the purpose for which he has used it. At the time that I invented this instrument, I was a rather firm believer in the treatment of stricture by divulsion. I do not employ this method now, although I would use it in a case of retention of urine. It is no more dangerous than cutting, and cutting is no more dangerous than divulsion. The cutting can be more accurately limited than the divulsion. With the latter method we tear not only the stricture, but also the mucous membrane at some distance in front of and behind the stricture. In a specimen in my possession where divulsion was employed, there were no less than nine rents in the mucous membrane, and the rent in the stricture was oblique and had not gone completely through the stricture. This method will do in superficial strictures, but in hard fibrous strictures we have to supplement this operation with urethrotomy. It is for this reason that I have given up divulsion for internal urethrotomy, and I do not resort to this latter operation so frequently as I formerly did. When the patient is within convenient distance, I much prefer in ordinary cases of inflammatory stricture, and in recent cases more particularly, to resort to gradual dilatation. I have reached the firm conviction that the cases in which radical cure is produced by divulsion, internal incision, or external incision, are so rare that it is rarely worth while to resort to these operations.

DR. CHARLES B. NANCREDE said: While agreeing with most of that which has been advanced by Dr. Brinton, I am rather more in accord with the last speaker. When I intend to do any radical operation, I prefer incision, for then I know exactly what I am doing. My experience teaches me that filiform bougies are not always easily passed through a stricture, even when it is of comparatively large size. Where I have failed to pass the filiform bougie, I have frequently succeeded with a metallic instrument of fair size. I have never had to tap a bladder for retention, but have always succeeded, sooner or later, in getting into the bladder with a filiform bougie.

Although well aware of the eccentric position of the orifice of most strictures, I was particularly struck with the usefulness of recognizing this fact some years ago, in a case of organic stricture in which the urethra had ruptured. Dr. Packard had made several incisions to relieve the infiltration of urine, and when the patient was turned over to me as a hospital case, the larger part of the urine was passed through an opening at one side of the root of the penis. I tried, on a number of occasions, to pass filiform and other bougies, but always failed. I then called a consultation, intending to perform external urethrotomy. Under ether, I again failed to pass any instrument. I asked Dr. Packard to try. Passing the bougie down to the stricture, he carried

it transversely to the left, at a right angle to the course of the urethra, passed it in this direction for about half an inch, and then again by a right-angled turn passed the instrument on in the normal direction of the urethra through the stricture, which was not tight. The instrument was tied in, and the patient eventually recovered. In like manner, a twisted filiform bougie may do good service in a tight stricture. I do not think that the filiform instrument is entirely free from danger in the hands of a tyro. There are cases in which the extremity has been caught in a crypt behind the stricture, a false passage made, and this erroneous route has been followed up with other instruments. Whalebone filiform bougies are, however, of the utmost value when skilfully used, and I should feel completely lost without them to fall back upon in a difficult case. Like Dr. Brinton, I have found it necessary to make them myself. I heartily endorse his method of procedure after the tunnelled catheter or sound has entered the stricture, and have for years resorted to it myself, with invariable success.

DR. BRINTON said: The remarks which have been made only show that every surgeon operates according to the habit of his own mind and hand. While I do not claim that the method which I have described is better than that of others, I can only say that it is one which I have followed for many years, which has yielded me great success in the past, and to which I look forward with confidence in the future. I believe, too, that uniform success in this procedure can only be secured by the use of properly constructed filiforms, and by the observance of the cautions to which I have referred.

A SERIES OF THREE EPITHELIAL OR PSEUDO-  
MEMBRANOUS CASTS OF THE TONSIL AND  
PALATINE FOLDS FROM A CASE  
OF DIPHTHERIA.

BY J. SOLIS-COHEN, M.D.

[Presented January 12, 1887.]

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THE patient is an adult, and has exhibited no symptoms of a constitutional infection. The local disease was limited to the tonsils and palate: one tonsil became parenchymatously enlarged and underwent suppuration. The abscess was opened twice. At present there is an additional abscess in the upper portion of the palate. There has been no complication in the case except from difficulty in deglutition, so great that for forty-eight hours the patient had to be nourished mainly by the rectum. Two days ago there was brought to me a thin sheet of false membrane, which was an accurate mould of the tonsil and palatine fold. Yesterday, a similar mass of desquamation, having much the same shape, was brought; and this morning a third mould had been thrown off. The appearance of the second cast closely resembles a cast of the interior of the larynx and trachea, and could readily have been mistaken therefor had there been any laryngeal complication. Manipulation, however, demonstrates that it has sheathed the tonsil and one of the palatine folds.

The point to which particular attention is called, is the physical resemblance of these patches to the desquamated epidermis in scarlatina.



## SUPRAPUBIC LITHOTOMY, FOLLOWED BY DEATH FROM PERFORATING ULCER OF THE STOMACH.

By JOHN B. ROBERTS, M.D.

[Read by H. A. WILSON, M.D., January 12, 1887.]

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THE following case of removal of stone from the urinary bladder by the suprapubic or high operation, is reported as proving the position which I have so long insisted upon, that this operation is easily accomplished, and is free from many of the dangers of the lateral perineal operation.

C. H., aged sixty-three, applied to me for relief from frequent urination, and other bladder symptoms, and was sent to the wards of the Pennsylvania Hospital. Upon the introduction of the lithotomy sound, it was easy to discover the presence of a stone. When the catheter was used, the stone was struck before any urine was drawn from the bladder, apparently proving that the calculus lay close behind the prostate gland. The patient was a very fat man, with poor circulation, and evidently a bad subject for etherization or operation. The urethra was large and easily distended. It therefore seemed to me proper to attempt the removal of the stone by the rapid crushing method.

With this object in view, I had him frequently dilated with large bougies, in order that the urethra and bladder might become tolerant to the contact of instruments. Subsequent to this preparatory treatment, I made an attempt to crush the stone with a lithotrite, expecting to evacuate the fragments by the ordinary method of Bigelow. Repeated efforts proved the impossibility of seizing the stone, either because it was too large to fall into the grasp of the blades of the instrument, or because it was encysted behind the prostate gland. Even with a finger in the rectum, and with the jaws of the lithotrite turned downward, seizing the stone was impossible.

As the man's perineum was deep, and as I believed that the perineal operation was inferior to the suprapubic one, because of the liability of hemorrhage, of injuring the seminal ejaculatory apparatus, and also because of the supposed size of the stone, and its possibly encysted character, I determined to perform the suprapubic operation.

After etherization, a rubber bag, to which was attached a long tube, was placed in his rectum, and filled with about twelve ounces of warm water. The bladder was afterward filled with six or eight ounces of a weak solution

of bichloride of mercury. A three inch incision was then made in the median line through the skin and a depth of nearly two inches of adipose tissue. The muscles were then separated, and the tissues torn through with my finger until I came upon the distended bladder. By means of a curved needle I passed a string through the top of the bladder, and brought both ends out of the wound to serve as a handle by which the bladder could be held up close to the surface. A longitudinal incision of about an inch in length was then made in the anterior wall of the bladder from above downward. The water immediately escaped from the bladder, and on the introduction of my finger I felt a large flattened stone lying in the lower portion of the organ, but not encysted. After some little difficulty the calculus was seized in ordinary lithotomy forceps and drawn out of the bladder; the wound in which was then closed with interrupted catgut sutures. The muscles were brought together by buried sutures of catgut, and the integument subsequently closed in the same manner. A drainage tube was carried in at the middle of the incision and pushed down into the space between the anterior wall of the bladder and the pubic bone. The edges of the wound were finally sprinkled with powdered iodoform, and the ordinary antiseptic dressing of gauze and corrosive sublimate applied. A hard-rubber catheter was left in the urethra in order to drain the bladder. At the end of twenty-four hours it was found impossible to keep the catheter in the bladder because of the pain which it gave the patient. Accordingly his urine was drawn at frequent intervals by means of a catheter similar to that originally introduced, but it was very difficult to keep the dressings properly applied and avoid their becoming soiled by the urine.

Three days after the operation the wound seemed well united along the surface, and a couple of days later the drainage tube and two of the sutures were removed. Dribbling of urine soon began to occur through the opening left by the withdrawal of the tube. This continued until eight days after the operation, upon which day the last suture was removed. On the evening of the same day the patient vomited about six ounces of blood, and during the straining of the vomiting on that day, or on account of the sitting up in bed a few days later, the wound became gaping throughout its entire length. The edges of this reopened wound were again brought together by sutures of silk-worm-gut and shot.

From this time forward the man's general condition was bad, although the wound gradually closed, except superficially, and all dribbling of urine from the wound ceased. In fact, he seemed to have recovered from the local effects of the operation, and to have left merely the deep wound through the skin and superficial fascia. Here the granulations were sluggish, and the repair of the opening in the fatty tissues and skin very inactive. He was, however, able to pass his urine normally through the penis, and, so far as urinary symptoms were concerned, was in a very comfortable condition. There persisted, however, nausea, a dull, uncomfortable feeling of pain in the epigastric region, and a total want of appetite. I was unable to make any definite diagnosis as to the meaning of these symptoms. Disease of the liver or stomach was the suggestion which came to mind.

Two months after the operation he suddenly suffered intense pain in the epigastrium, and immediately went into a condition of profound shock, from

which he never reacted. A few days before this time he had been sitting up in a chair every day, and the wound in the abdomen was almost closed. He had no trouble in urinating, and was very comfortable, except for the epigastric pain and the great weakness.

The post-mortem examination showed a large gastric ulcer the size of a silver dollar, which had caused perforation of the walls of the stomach, and had allowed its contents to escape into the peritoneal cavity. The cause of the vomiting of blood, of the impaired nutrition, and of the constant pain which he suffered for many weeks before death, was, therefore, shown to be a gastric ulcer, probably present before the time of operation, but latent in regard to symptoms.

The ease with which the suprapubic operation can be performed, due largely to the distention of the rectum and bladder by the fluid forced into them previous to making the first incision, was clearly demonstrated in this case. The facts that union of the bladder wound and early restoration of the functions of the bladder in regard to urination readily occur after the high operation for stone, and that wounding of the peritoneum is easily avoided, make this method of removing vesical calculi very satisfactory. The unfortunate death of the patient from disease of the stomach does not in any way vitiate the results of the operation; for, although the patient had not recovered sufficiently to be discharged from treatment, still the operation had effected the results which I sought.

## ABDOMINAL SECTION FOR TRAUMATISM.

By THOMAS S. K. MORTON, M.D.

[Read January 26, 1887.]

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THE term "abdominal section for traumatism" is meant to include those cases where the operator deliberately opens the belly, or greatly enlarges an existent wound for the purpose of discovering intraperitoneal wounds, and, if they are present, repairing them as far as possible, together with more or less final cleansing of the peritoneal cavity. Such cases as those in which wounds of prolapsed viscera are simply repaired, and the parts returned to the abdominal cavity, are not included. My excuse for this paper is, that I have been so fortunate as to be associated as an assistant to more than one-half of all the cases that have occurred in Philadelphia. In four of the cases I have been the assistant, and in three the care-taker also. These four cases have been treated in the Pennsylvania Hospital. I had at first expected to read merely the history of these cases, and make a few remarks, but the matter grew so interesting that I determined to make a study of the subject, and I believe that I have canvassed the literature of the world. I must express great obligations to the gentlemen who permit me to report their cases for the first time to-night, and to Dr. Billings, of Washington, who had translated for me the reports of two Russian cases. I have used the libraries of the College of Physicians and Pennsylvania Hospital, and have found the *Index Medicus* of great service. I have prepared these large tables, which contain a mine of information. They represent an abstract of every case which I have been able to find in the literature of the subject.

I shall, in the first place, read a few statistics derived from the tables. The total number of cases is 57. Of these, 36 died, and 21 recovered: mortality, 63 per cent.

These 57 cases were done by 42 operators, viz., 23 United States operators did 35 operations, with 11 recoveries, and 24 deaths: mortality, 67 per cent.



TABLE I.—GUNSHOT WOUNDS.

| Operator and reference.                                                                                                                                                                                                     | Age                     | Time after injury.                              | Special symptoms.                                                                                                                                                                         | Intraperitoneal injuries, etc., found.                                                                                                                                                                                                                                                | Treatment of intraperitoneal injuries.                                                                                                                                                  | Result.                                                                      | Remarks and post-mortem.                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A. R. KYNLOEN. North Car. Med. Journ., 1882, x. 1.<br>Kocher. Correspond. für Aertze, 1883, No. 23.                                                                                                                         | Adult                   | 11 hours.                                       | Slight shock; general abdominal pain; pain in sacral region; hole in rectum.<br>Collapse; signs of peritonitis.                                                                           | Much blood and feces; 5 perforations of intestine, 2 of mesentery; rectal wound could not be found.<br>Much blood; wound of large curvature and fundus of stomach $1\frac{1}{2}$ in.                                                                                                  | Trimmed, and sutured with Lembert's stitch; drain.<br><br>Sutured.                                                                                                                      | Died in 16 hrs.<br>Recovered.                                                | Post-mortem: another intestine wound found.                                                                                                                                                                                        |
| JORDAN LLOYD. Brit. Med. Journ., 1883, i. 560.<br>W. WATKINS SEYMOUR. N. Y. Med. Journ., 1886, xlv. 209.<br>C. A. JENSEN. Med. Record, Oct. 16, 1886.                                                                       | 14<br>19 F.<br>15<br>44 | 3 hours.<br>48 hours.<br>13 hours.<br>20 hours. | Little shock; no vomiting; later constant vomiting and peritonitis.<br>No shock at any time; vomited; some pain down left sciatic nerve.<br>Much shocked; pain and tenderness of abdomen. | Much stinking brown fluid; ragged wound of small intestine $\frac{3}{4}$ inch in diameter.<br>Acute peritonitis; 3 lines of colon destroyed; 2 wounds of meso-colon; thickened duodenum.<br>4 wounds of small intestine; 2 perforations of mesentery; abrasion of mesentery.          | Intestine stitched to wound.<br><br>All approximated with Lembert sutures.                                                                                                              | Died in $\frac{1}{2}$ hr.<br>Died in 21 hrs.                                 | Post-mortem: mesentery perforated; contusion of bladder.<br>Post-mortem: wounds in good condition; no others found.                                                                                                                |
| T. ANNANDALE. Lancet, 1885, i. 740.<br>F. S. DENNIS. Med. News, 1886, xlviii. 223-233.<br>F. S. DENNIS. Ibid.                                                                                                               | 15<br>23<br>26 F.       | 1 hour.<br>...<br>...                           | General shock; slight pain in abdomen and pelvis.<br>Great shock.<br><br>.....                                                                                                            | Considerable blood; 5 wounds of small intestine, 2 in colon, 2 in rectum; wound of mesentery.<br>Much blood; wound of liver and its great vessels.                                                                                                                                    | All wounds, except the abrasion, stitched with Lembert's sutures.<br>All closed with Lembert's sutures.<br>None; abdomen rapidly closed.<br><br>Wounds sutured.                         | Died in 19 hrs.<br>Died in 24 hrs.<br>Died in 48 hrs.                        | Post-mortem: mesenteric wounds; sloughing, and bathed with pus.<br>Walked 100 yards after injury.<br>Post-mortem: wounds firm; no others found.                                                                                    |
| A. V. PARK. Chicago Med. Journ. and Examiner, 1885, li. 412.<br>W. T. BRUCE. Med. News, 1885, i. 171.<br>E & W. E. ANDREWS. Adult Journ. Am. Med. As., 1885, p. 177.<br>J. B. HAMILTON. Journ. Am. Med. As., 1885, ii. 202. | 16<br>22<br>22<br>19    | 22 hours.<br>17 hours.<br>...<br>...            | Abdomen tympanitic; no liver dullness.<br><br>Vomiting; pain; tenesmus; involuntary micturition.<br>Vomited much blood; diffused tenderness of abdomen.<br><br>.....                      | Much blood; 7 wounds of intestine, and 1 of mesentery; uncontrollable hemorrhage from iliac veins.<br>Great quantity of blood; $\frac{1}{2}$ in wound, also groove in small intestine.<br>5 wounds of small intestine; 1 wound of sigmoid flexure.<br>Considerable bloody serum only. | Lembert sutures to groove and perforation.<br><br>Lembert sutures to all.<br><br>.....<br><br>Lembert suture to intestine; wounds ligatured, and removal of injured portion of omentum. | Died in 48 hrs.<br>Died in 15 hrs.<br>Recovered.<br>Recovered.<br>Recovered. | Post-mortem: abdominal cavity filled with blood.<br>Post-mortem: few clots; peritonitis; contused wound of rectum.<br>Ball found among intestines.<br><br>Pelvic suppuration; hematocoele evacuated through rectum on twelfth day. |

TABLE I.—GUNSHOT WOUNDS (*continued*).

| Operator and reference.                                      | Age.  | Time after injury. | Special symptoms.                                                                             | Intrapertitoneal injuries, etc., found.                                                                                       | Treatment of intraperitoneal injuries.                              | Result.              | Remarks and post-mortem.                                                                   |
|--------------------------------------------------------------|-------|--------------------|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------|
| T. G. RICHARDSON. N.O. Med. and Surg. Jour. 1886, xiii. 807. | Adult | 9 hours.           | Great shock; vomiting; signs of incipient peritonitis.                                        | 3 tears of intestine; 1 of mesentery.                                                                                         | All sutured.                                                        | Died in 14 hrs.      |                                                                                            |
| A. C. L. RAMSAY. Northwestern Lancet, 1885, iv. 377.         | 7     | 6 hours.           | Great pain; much vomiting.                                                                    | Much blood; extensive wound of duodenum; contusion of colon.                                                                  | Excision of gut including wound; Lembert sutures.                   | Died in 1 hr.        |                                                                                            |
| Wm. T. BULL. Med. News, 1886, xlix. 601.                     | 24    | 6 hours.           | Severe abdominal pain; shock; vomiting; diminished liver dullness; fluid in abdominal cavity. | 2 wounds of small intestine; 2 of transverse colon; extravasation into meso-colon.                                            | All sutured by Lembert's method.                                    | Died in 8 hrs.       | Post-mortem: nothing more than above.                                                      |
| Wm. T. BULL. Med. News, 1886, xlix. 524.                     | 57    | 12½ hours.         | Shock; vomiting; scarce any pain.                                                             | Great amount of blood; left lobe of liver almost divided.                                                                     | None; abdomen closed.                                               | Died on table.       | Post-mortem: no other wounds found.                                                        |
| Wm. T. BULL. Med. News, 1886, xlix. 524.                     | 25    | 2½ hours.          | Nausea; abdomen appeared normal; only vicinity of wound tender.                               | 2 wounds of small intestine; 3 tears of peritoneum of meso-colon; omentum and anterior epiploic appendages torn and bleeding. | Lembert sutures to intestinal wounds; omentum and appendix excised. | Recovered.           |                                                                                            |
| ABBE. Med. News, 1886, xlix. 524.                            | 53    | 3½ hours.          | Slight shock; vomiting; rapid and increasing abdominal pain; tympany.                         | 4 wounds of small intestine; wound between bladder and rectum. Much sub-peritoneal extravasation.                             | All approximated with Lembert's suture.                             | Died in 9 hrs.       | Walked two squares after injury. Post-mortem: purulent peritonitis; ball found in bladder. |
| F. J. LUTZ. Weekly Med. Rev., 1886, 514.                     | 21    | ...                | Right side of abdomen tympanitic; left side dull.                                             | 7 wounds of small intestine, 4 wounds of mesentery.                                                                           | Lembert's suture; ligature to mesenteric artery.                    | Died in 3 days.      | Post-mortem: purulent peritonitis; wounds in good condition.                               |
| MACCELLAR. Lancet, 1887, i. 37.                              | 23    | 30 hours.          | Some shock; no evidence of wound of bowel; next day peritonitis.                              | 2 wounds of lower portion of sigmoid flexure.                                                                                 | Wounds could only be ligated.                                       | Died in a few hours. | Post-mortem: no other wounds; bullet between rectum and bladder.                           |
| C. B. NANCY. Phila. Acad. of Surg., 1886.                    | ...   | ...                | At first little pain or shock, later copious bloody vomiting.                                 | Perforation of anterior and posterior forations of duodenum.                                                                  | Lembert sutures; "cleansing."                                       | Died in 3 days.      | No post-mortem.                                                                            |
| T. G. MORROX. Unreported.                                    | 36    | 1½ hours.          | Some pain; no shock; vomited blood copiously.                                                 | 4 wounds of stomach; 1 of transverse colon; omentum much lacerated.                                                           | Lembert sutures to all.                                             | Died in 6 hrs.       | Post-mortem: wounds and abscesses all right; large hemipneura from cut intercostal artery. |

TABLE II.—STAB WOUNDS, INCLUDING ONE BY SPLINTER OF WOOD.

| Operator and reference.                                         | Age.     | Time after injury. | Special symptoms.                                                          | Intra-peritoneal lesions found.                                                               | Treatment of intra-peritoneal wounds.                   | Result.              | Remarks and post-mortem.                                  |
|-----------------------------------------------------------------|----------|--------------------|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------|----------------------|-----------------------------------------------------------|
| G. TILING, St. Pgh. Med. Wch., 1884, No. 24.                    | 19       | Soon               | Vomited much blood.                                                        | Much blood; 1½ in. wound of gut; curvature of stomach; 2 wounds of omentum.                   | Lembert sutures.                                        | Recovered.           |                                                           |
| W. O. ROBERTS, Am. Pract., 1884, xxix. 13.                      | 44       | A few hours.       | Considerable hemorrhage from wound.                                        | 2 wounds of small intestine; 2 of mesentery.                                                  | All sutured.                                            | Recovered.           |                                                           |
| BARKER, Laucet, 1886, i. 347.                                   | Adult F. | 3½ hours.          | .....                                                                      | Incised wound of omentum.                                                                     | None.                                                   | Recovered.           |                                                           |
| J. B. ROBERTS, Polyclinic, 1886, iii. 93.                       | 19       | 2 hours.           | Great shock; vomiting; violent pain                                        | 2 wounds of small intestine.                                                                  | Lembert sutures.                                        | Died in 2 days.      | Post-mortem: purulent peritonitis; one wound over-looked. |
| F. S. DENNIS, Med. News, 1886, xlviii. 225-253.                 | 22       | ...                | .....                                                                      | 2 incised wounds of small intestine—1 cut serous and muscular coats of intestine. None found. | Czerny-Lembert sutures.                                 | Recovered.           |                                                           |
| F. S. DENNIS, Med. News, 1886, xlviii. 225-253.                 | 57       | 3 hours.           | .....                                                                      | 2 large wounds of small intestine.                                                            | None.                                                   | Recovered.           |                                                           |
| F. S. DENNIS, Med. News, 1886, xlviii. 225-253.                 | 25       | Next day.          | Had been stabbed in hernia; hernia reduced; peritonitic symptoms next day. | .....                                                                                         | Resection of gut, including wounds.                     | Died in a few hours. | Post-mortem: resection all right; no other wounds.        |
| F. S. DENNIS, Med. News, 1886, xlviii. 225-253.                 | 22       | ...                | Considerable hemorrhage from external wound.                               | 5 wounds of small intestine.                                                                  | Czerny-Lembert sutures.                                 | Died in 40 hrs.      | Post-mortem: wounds in good condition; no other wounds    |
| J. McF. GASTON, Med. and Surg. Rep., 1886, liv. 739             | 30       | 4 days             | Much shock; afterward acute peritonitis.                                   | Brush buru of colon.                                                                          | None.                                                   | Died shortly.        |                                                           |
| J. G. BROOKS, Med. Herald 1886, viii. 134.                      | 11       | A few hours.       | Great shock; abdomen tense and dull.                                       | Great quantity of blood; cut and bleeding mesentery.                                          | Vessels ligated.                                        | Recovered.           | Admitted with opium poisoning, from which he died.        |
| W. S. TREMAINE, Med. News, 1886, xlix. 601.                     | 18       | 10 hours.          | Opium poisoning also; free bleeding from wound.                            | None.                                                                                         | None.                                                   | Died.                |                                                           |
| J. B. ROBERTS, Unpublished.                                     | 40       | ¾ hour.            | Violent abdominal pain; profuse small knuckle intestine; free hemorrhage.  | 4 wounds of small intestine; 1 of colon; mesentery transfixed.                                | All closed with Lembert sutures.                        | Recovered.           |                                                           |
| KWIECINSKI, Pregl lik. Krakow, 1885, xxiv. 71.                  | 20       | At once.           | Great pain; vomiting.                                                      | 3 wounds of small intestine.                                                                  | Sewed.                                                  | Recovered.           |                                                           |
| G. GUARCO, Genova, 1886. Due casi di enter ferite di intestine. | 30       | ...                | .....                                                                      | Wounds of intestines.                                                                         | Lembert sutures.                                        | Recovered.           |                                                           |
| G. GUARCO, Genova, 1886. Due casi di enter ferite di intestine. | 30 F.    | ...                | .....                                                                      | Wounds of intestines.                                                                         | Lembert sutures.                                        | Recovered.           |                                                           |
| WUNNERLIEN, N. Y. Med. Journ., 1887, i. 68.                     | 19       | 6 hours.           | .....                                                                      | ¾ in wound of gut—anterior curvature of stomach.                                              | Lembert sutures.                                        | Died in 1 hour.      | Post-mortem: wound in good condition.                     |
| J. B. DEAYER, Unpublished.                                      | Adult    | ...                | Much blood in peritoneal cavity; great shock.                              | Wound of spleen.                                                                              | Excision of spleen.                                     | Died.                | Post-mortem: wound of kidney, etc.                        |
| T. G. MORTON, Unpublished.                                      | 20       | 9 hours.           | Increasing pain about wound; also emphysema; no shock.                     | Wound of omentum, 1½ inch.                                                                    | Suture of omentum; ligature of bleeding omental artery. | Recovered.           |                                                           |
| J. AVERY, Med. Age, 1885, iii. 412.                             | Adult    | 7 hours.           | Much shock.                                                                | 2 wounds of small intestine, 1 of mesentery.                                                  | Wounds trimmed, and Glover's sutures introduced.        | Recovered.           |                                                           |



TABLE III.—RUPTURED BLADDER.

| Operator and reference.                       | Age.  | Time oper. after injury | Special symptoms.                                                                                     | Intrapertitoneal lesions.                                                                  | Treatment of intrapertitoneal lesions.                                    | Result.         | Remarks and post-mortem.                             |
|-----------------------------------------------|-------|-------------------------|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|-----------------|------------------------------------------------------|
| WALTERS.                                      | 22    | 10 hours.               | Signs of active peritonitis.                                                                          | Much blood and urine; extensive tear at base of bladder.                                   | Removal of foreign contents. Drainage tube.                               | Recovered.      | Catheter in bladder also.                            |
| Wm. T. BULL. An. of Surgery, 1885, i. 67.     | 46    | 13 hours.               | Great shock; bloody urine; dulness half way to umbilicus; catheter went beyond bladder.               | 3 3/4 inches rent of posterior wall of bladder.                                            | 7 Lembert sutures.                                                        | Died in 7 hrs.  | Also bad fractured pelvis.                           |
| Jos. M. Fox. Unpublished.                     | 38    | 19 hours.               | Great pain about bladder, and desire to micturate; bloody urine; great shock.                         | Much blood and urine; 2 1/2 inch triangular rent in anterior wall of bladder.              | 15 Lembert sutures; soft catheter in urethra.                             | Died in 42 hrs. | No abdominal drain. Post-mortem: bladder wound firm. |
| J. DIXON. Lancet, 1886, ii. 399.              | 38    | 22 hours.               | Shock; desire to urinate, but no power; bloody urine; peritonitis; vomiting.                          | Blood and urine; 2 1/2 in. rupture of posterior bladder wall.                              | Glass drain sutured into bladder wound.                                   | Died in 55 hrs. | Suppression of urine.                                |
| Wm. MAC CORMAC. Lancet, 1886, ii. 1118.       | 37    | 27 hours.               | Fluid present in abdomen; signs incipient peritonitis; nausea.                                        | Large amount of bloody fluid; 3 in. rent upper portion of bladder wall.                    | 12 Lembert sutures.                                                       | Recovered.      | Urine passed voluntarily from first.                 |
| McGILL. Lancet, 1886, xxi. 972.               | ...   | 3 days.                 | Insensible for time; pain; bloody urine; could not urinate, though had desire; incipient peritonitis. | Pint of urine; 4 in. rent of apex and fundus of bladder.                                   | 11 sutures.                                                               | Died in 17 hrs. | Post-mortem: bladder wound firm.                     |
| C. HEATH. Brit. Med. Journal.                 | Adult | 40 hours.               | Tense belly; bloody urine by catheter; injected water felt through abdomen by patient.                | Rent of bladder.                                                                           | Continuous suture.                                                        | Died in 6 dys.  | Post-mortem: suture had given way.                   |
| HORMIGL. Brit. Med. Journ., 1883, i. 560.     | Adult | ...                     | Principally those of extra-pertitoneal rupture.                                                       | Intra- and extra-pertitoneal rupture of bladder; great infiltration of tissues with blood. | Partial suture; upper portion left open, and drained.                     | Recovered.      |                                                      |
| MAC CORMAC. Lancet, 1886, ii. 1118.           | 33    | 19 hours.               | 95 oz blood-tinged urine drawn. Had walked mile to hospital day after injury.                         | 4 inches median vertical rent of bladder.                                                  | 16 Lembert sutures; peritonitis; at sides divided to relax bladder walls. | Recovered.      |                                                      |
| A. WILLETT. St. Barth. Hosp. Rep., 1876, 209. | 48    | 29 hours.               | Shock and pain; bloody urine by catheter later; symptom of peritonitis.                               | 3 3/4 inches rent across fundus of bladder.                                                | Interrupted sutures.                                                      | Died in 23 hrs. | Post-mortem: portion of wound found open.            |

TABLE IV.—RUPTURED AND CONTUSED INTESTINE.

|                                                          |    |           |                                                                                                          |                                                                                       |                                     |                   |                                                                  |
|----------------------------------------------------------|----|-----------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------|-------------------|------------------------------------------------------------------|
| BOULLY Bull. et Mem. Soc de Chir, 1883, 690.             | 29 | 23 hours. | Signs of incipient peritonitis; fecal vomiting.                                                          | 3-inch rupture of small intestine; also gangrenous bruise of intestine above rupture. | Resection 5 inches small intestine. | Died in 10 dys.   | Post-mortem: gangrenous portion had given way after manipulation |
| CHEVASSE Ib., 1885, 123.                                 | 23 | ...       | Shock at first, then peritonitis.                                                                        | Colon badly contused in two places; Intestine and meso-colon infiltrated with blood.  | None.                               | Died in 6 dys.    |                                                                  |
| E. A. WAGGONER. St. Louis Cour. of Med., 1886, xvi. 204. | 8  | 27 hours. | Walked 400 yards; great shock followed by violent peritonitis.                                           | Rupture of intestine 2 1/2 feet above ileo-caecal valve; much feces.                  | Sutured.                            | Died in 2 hrs.    |                                                                  |
| T M GIRDLESTONE. Australia Medical Journ., 1883.         | 22 | 4th day.  | Shock, which was followed by development of peritonitis; vomiting.                                       | Almost complete rupture of ileum; tears of omentum.                                   | Excision of wounded bowel.          | Died in 1 1/2 hr. |                                                                  |
| FITZGERALD. Ibid, 1883, 264.                             | 58 | 20 hours. | All signs of double strangulated hernia. (His truss had been pressed violently against descended hernia) | Ruptured small intestine.                                                             | Sutured.                            | Died in 8 hrs.    |                                                                  |



9 English operators did 10 cases, of which 3 recovered, and 7 died: mortality, 70 per cent.

2 Australian operators did 2 operations, with 2 deaths.

2 French operators did 2 operations, with 2 deaths.

2 Russian operators did 2 operations, with 2 recoveries.

1 German and 1 Swiss, each did an operation, with success.

1 Italian operator did 2 operations, with 2 recoveries.

7 operations have been done in Philadelphia by 5 operators, with 2 recoveries and 5 deaths. 5 of these have been performed at the Pennsylvania Hospital by 3 operators, with 2 recoveries, and 3 deaths.

Of the 57 tabulated cases, 38 per cent. were for pistol- or rifle-shot wounds; 35 per cent. for stabs; 17 per cent. for ruptured bladder, and 10 per cent. for ruptured intestine.

Operations were done according to years as follows: 1862, one; 1876, one; 1879, one; 1882, one; 1883, seven; 1884, five; 1885, thirteen; 1886, twenty-nine.

In every case which died after operation, lesions certain to cause death, if uninterfered with, were found. One case of penetrating wound was opened, in which no visceral injury was found; it recovered.

The first case of abdominal section for traumatism was that of Walters', of Pittsburg, for ruptured bladder, in 1862. The first successful case was the same. The first case after Walters' was that of Heath, in 1876. The first recovery after Walters' case was that of Dr. W. O. Roberts, done for stab wound, August 28, 1882.

The sex was reported in 56 cases: males 52, of this number 33 died, and 19 recovered. There were 4 females, of which number 2 died, and 2 recovered. 4 were negroes, all males; 1 recovered, and 3 died.

The age was reported in 46 cases, the oldest being 58 years, and the youngest 7 years. The ages ranged as follows:

1 each 7 and 8 years old; both died.

11 between 10 and 20 years; 4 recovered, and 7 died.

15 between 20 and 30 years; 5 recovered, and 10 died.

9 between 30 and 40 years; 5 recovered, and 4 died.

1 each 53 and 58 years; both died.

2 57 years; 1 recovered, and 1 died.

The indications for abdominal section for traumatism are in many cases very clear; in others, with only our present knowledge, exceedingly obscure. Taking up the consideration first of wounds, it seems to me that, with what we already know, the operation is clearly indi-

cated in every case where penetration of the abdominal cavity is proven, and with fair surroundings it becomes one's duty to open the abdomen and search for wounds, for there are no omnipresent symptoms which invariably indicate intraperitoneal wounds, even when extensive. With reference to the cases suitable for operation, I would say that, besides gunshot wounds, stabs, etc., which have already been operated upon, I conceive that in the future many other traumatic conditions will be subject to interference by section, such as rupture of the stomach, gall-bladder, spleen, or kidney, ruptured bloodvessels, various hæmatoceles, etc. Dennis, of New York, had a case in which he opened a penetrating stab wound of the abdomen. He found, besides the injuries, an intussusception evidently caused by the violent peristalsis excited by the point of the knife touching the intestine, and I therefore conceive the possibility of intussusception without wounds. In this paper, no consideration is paid to the effects of traumatism upon diseased organs, such as ulcerated stomach or bowels, or upon the pregnant uterus or its diseased appendages, or perforating typhoid ulcers.

I shall consider the subject of diagnosis as a whole, with the exception of that of ruptured bladder which I shall take up later. The diagnosis of penetrating wounds of the abdomen is occasionally very easy—occasionally exceedingly difficult. Where there is a pistol-shot wound of the anterior wall of the abdomen and a probe can be inserted, or where there is extravasation of feces, the diagnosis is easy enough. Emphysema is given as one of the best symptoms of perforation of the intestine. I regard it as a poor one. One of the cases occurring in the Pennsylvania Hospital presented marked emphysema of the abdominal walls without injury to the lung or intestine. Injury of the lung may give rise to emphysema, which may be mistaken for that due to a wound of the intestine. Diminution of the liver dulness due to the escape of flatus into the abdominal cavity is another symptom, but this is fallacious. Shock is usually marked, but in some cases the patient is not at all shocked. Instances are on record where patients have walked long distances, and yet, on opening the abdomen, wounds of the intestines have been found. One man did not even know that he was shot until he had walked some distance to his home—yet he had numerous intestinal perforations. Of course, vomiting of blood and the passage of bloody stools are good signs, but they are not always reliable. The symptomatology of penetrating wounds of the abdomen is very obscure and we should like to have some light thrown upon it. Of course, a

wound through the back is more difficult to diagnose than one from the front, and frequently the diagnosis can only be made by incision. Even where the ball is found lying under the skin, you cannot be sure, for it may have passed around the abdomen. The most interesting class of cases is that in which there has been a blow or injury upon the abdomen and we suspect rupture of the intestine, the spleen, liver, or bloodvessels. These are most difficult cases to diagnose, and I predict that in the future we shall open many abdomens in order to determine whether or not these conditions are present.

In regard to the surroundings under which one should operate. In a metropolitan hospital surrounded by every convenience, I think that the majority of cases should be operated upon. In cases where injury to the gut is known to have occurred, and in many cases where it is suspected, it is our duty to operate. In the country and in unskilled hands only those cases which are the most desperate should be operated upon, unless they can be removed to some centre.

If the patient appears to be coming out of shock, he should be allowed to do so as far as possible. Shock from hemorrhage is, of course, the worst. Where there is extravasation, the shock will be kept up, and under such circumstances etherization and removal of the cause would be the best way to overcome it. The preparation of the patient should be by judicious treatment and thorough cleansing. I shall not to-night go into the subject of antisepsis or asepsis, although I hold positive views of their great value. Everything should, however, be surgically clean.

Where there is a wound of the anterior wall of the abdomen, first prove perforation by cutting down to the peritoneum. That should be a sufficient warrant for section. In wounds of the back some judgment must be exercised. The incision should, I think, in almost every case be median. In the majority of the cases recorded in the table, and, I think, in nearly all the successful cases, the incision was median. In several instances where section has been done for a special purpose, such as removing an injured spleen, the incision has been made on one side of the median line. In one case of stab wound which I saw, the original wound was enlarged and gave rise to great difficulty in the subsequent steps of the operation. One wound was overlooked in that case, which error, I think, was largely due to the position of the incision. The length of the abdominal wound is to be governed by the circumstances of the case. It may extend from below the ensiform cartilage to the pubes. There is no harm in a long wound if it be properly treated. After opening the peritoneum, note carefully the



abdominal contents. If we find feces, we are encouraged to prolong the search until the wound is found. If there is blood, we should look for the vessel injured. The search for wounds should be thorough and systematic. In most of the cases where wounds have been overlooked, it has resulted from not making a systematic examination. We should begin at the entrance of the œsophagus into the stomach, if it is possible to reach so high, go over the stomach and all the intestines, examine the mesentery, the rectum, and bladder, and look at the spleen. Unless this is done, wounds will sometimes be overlooked, and even with the utmost precaution they will sometimes escape detection. Only those who have seen these cases can imagine the difficulty experienced in finding such wounds, especially when the upper part of the transverse colon and the surrounding omentum are involved. If the intestines are much distended, it may be necessary to puncture them. It is important to remember that extravasation has followed such a puncture, and they should always be closed with a Lembert suture. If the vermiform appendix or an epiploic appendage is injured, it should be excised. In wounds of the intestine, it makes a difference whether the injury is the result of a gunshot or of a stab. Gunshot wounds are more apt to slough than knife wounds, and where many of the former are located close together, it has been found advisable to excise a portion of the gut including the numerous lesions. Probably a foot of the bowel may be excised without much disadvantage. Six or eight feet have been excised, but in this case the operation was followed by emaciation and death. In such a case it would probably be better to make several excisions. Perforations when found should be turned into the bowel by the suture of Lembert. Wounds of the large intestine and stomach are to be treated in the same way.

Where the ball has perforated the mesentery, the wound edges should be excised. This is the opinion of those who have done most operations. The opening is then brought together with stitches on both sides, or passing entirely through. If the omentum be badly injured, no harm will come from its excision. It may be ligated in various places and the whole cut off without injury. In a hernia case, I cut off what I supposed to be almost the whole omentum, and the man recovered perfectly. Where the spleen is wounded, the only method seems to be to excise the organ. This has been done, so far as I know, twice. Very little is known about the treatment of injuries of the spleen. Wounds of the liver have been met with a number of times and all the cases have died. Whether or not it would be



practicable in these cases to stitch the liver to the abdominal wall, etc., I cannot say. Tait has done it in chronic disorders a number of times and has had favorable results. We should be encouraged to experiment in this direction. About wounds of the pancreas little is known—I doubt if they could well be reached. If the kidney is extensively wounded, its excision or complete drainage is indicated. If the ureter is divided, the only remedy is excision of the corresponding kidney. If the projectile has gone through the diaphragm, the same operation as in the case of the mesentery would be indicated, namely, excision of the edges and sutures. Of course, all bleeding vessels are to be tied. If this is impossible, the main trunk, even if this be the aorta, must be tied. Wounds of the uterus and appendages have not been dealt with, but would probably require excision.

Then there is another class of wounds entering the abdomen—that is, wounds through the vagina and rectum; for instance, a stab wound through the vagina. If we knew that it penetrated, abdominal section would be indicated. In all these cases contusions or brush burns of the omentum and intestine frequently are found. In time, nearly all of these will slough and give rise to pus. In several cases death has been attributed to this cause. All severe contusions involving the mesentery or omentum should be excised. When they involve the intestine, the peritoneum should be united over them with Lembert sutures. The suture materials which I have seen used have been silk and catgut. I think the latter is preferable if fine and chromicized.

I have here one table which gives the average time after injury when the operation was performed. This is one of the most important things that we can consider. The sooner the operation is performed, the better are the chances of the patient. The cases in which the time is reported number forty-five. The average time after the injury for which operation was done, was eighteen and a half hours. Deducting four cases where more than two days had elapsed, the average falls to twelve and a half hours, while a deduction of all the cases where the time was over twenty-four hours, brings the figures to nine and a half hours. The average time after the injury when the operation was begun in the successful cases was seven and three-quarters hours; the average in the fatal cases was twenty-three and one-quarter hours. These are significant facts. In the five cases operated on at the Pennsylvania Hospital, the average time was six hours. Deducting one case in which from unavoidable circumstances twenty hours elapsed, the average comes down to three hours.

In all cases the question of drainage will arise. It is always diffi-

cult to decide, in any given case, whether drainage should be employed or not. If there have been extravasation and numerous wounds, drainage seems to be indicated. Glass and rubber tubes have been used with apparently equal success and failure. I think that tubes of glass or other hard material are to be preferred. Where there has been extravasation of the contents of the stomach or intestine, this is usually followed by great oozing of serum.

The final steps of the operation are irrigation and cleansing. In irrigation I believe most thoroughly. It should be very large in quantity and can hardly be too much so. If the patient is suffering from shock, there is no better treatment than pouring hot water through the abdominal cavity. It probably acts directly upon the solar plexus. I have seen this frequently used with marked benefit. The patient will be in far better condition after the use of a gallon or more of water at a temperature of  $100^{\circ}$  to  $110^{\circ}$ , than before its application. It has occurred to me that in profound shock from other causes, it might be well to puncture the abdomen with some form of double canula and thus irrigate the abdominal cavity with large quantities of hot water. What shall be put in the solution used for irrigation? Several agents have been so used: Water, distilled water, boracic acid solution, mild solution of bichloride of mercury, and solution of carbolic acid. Carbolic acid should be expunged from the list. Bichloride of mercury, when employed, should be in very dilute solution—1 to 5000 or 10,000. Boracic acid was used in two successful cases in three per cent. solution in unlimited quantities. In four cases at the Pennsylvania Hospital the bichloride solution in the strength of 1 to 5000 and 1 to 10,000 was used and apparently without any bad effect. It was used in both of the successful cases there. Distilled water is very good and especially in cases where extravasation has not occurred. Where there has been extravasation, purulent peritonitis set up, or it is not certain that all foreign matters have been removed, I think that an antiseptic is indicated. Where we have a solution like that of boracic acid, possessing fair strength with little danger of poisoning, it should be used. The parietal wound is closed and dressed in the usual manner.

One question in the after-treatment would arise in cases where a drainage tube had not been left, and would be with reference to reopening the wound and draining where a large amount of serum was present. Each individual case must be decided for itself. The onset of violent peritonitis would be an indication for reopening the belly, irrigating and draining it.

I wish now to take up a few of the classes of these cases in succession. Those which have been discussed before will not be reconsidered. Rupture of the bladder will be discussed separately. First, with reference to gunshot wounds. The total number of cases recorded is 22. Of these, 5 recovered and 17 died, a mortality of 77 per cent. Of these 22, 18 were done in the United States; 4 recovered and 14 died, a mortality of 77 per cent. The foreign cases were 4 in number, with 1 recovery and 3 deaths, a mortality of 75 per cent. The first recorded case of gunshot wound treated by abdominal section is that of Dr. Kinloch, of North Carolina, in 1881. The first recovery was the case of Kocher, of Switzerland, in 1883. The first American recovery was a case operated on by Dr. Wm. T. Bull, of New York, in 1884. These 22 cases were done by 15 operators—11 American and 4 foreign. In Philadelphia there have been 2 cases of abdominal section for gunshot wound. One was done at the Pennsylvania Hospital two days since by Dr. Thomas G. Morton. In one case of gunshot wound a wound of the intestine was overlooked, with a fatal result. McKellar, of London, reports a case of two wounds of the lower portion of the sigmoid flexure in which it was impossible to introduce stitches. All that he could do was to throw a ligature around the wounds. The patient died, and fecal extravasation was found at the autopsy. It struck me that in this case rectal distention by a colpeurynter might have been of some assistance, lifting the bowel up so that stitches could be inserted, for I understand that the openings were on the anterior wall. Such cases are, however, exceedingly difficult to remedy.

I will read the notes of a case of gunshot wound of the abdomen:

CASE I.—B. B., a negro, aged thirty-six, of splendid frame and constitution, was admitted late in the afternoon of January 23. Three-quarters of an hour before admission, he had been shot by a ball fired not more than a couple of feet from him; its calibre was 32. When admitted, he was not shocked; but slight nausea and severe general abdominal pain were present. Pulse and respiration slightly accelerated; temperature 98°. A bullet wound was found an inch and a half above and half an inch to right of the umbilicus. No tympany, emphysema, decrease of liver dulness, or other marked symptoms, were present until just before anæsthesia was begun. He then vomited more or less altered blood copiously. Abdominal section had been decided upon by Dr. T. G. Morton over the telephone, and full preparations having been made meanwhile, the operation was commenced almost immediately upon his arrival—an hour and a half after the accident.

The man's condition at that time was very good. The belly wall having been made surgically clean, and penetration proved, an incision was made by Dr. Morton from two inches below the ensiform cartilage to the pubes. In-



stantly upon opening the peritoncum a large quantity of fluid and clotted blood, together with much flatus and partially digested food and feces, gushed forth. The peritoncum, where not injured, looked in good condition. The cavity was first cleaned as well as possible by rapid sponging, and then searched for wounds. Three perforating wounds of the stomach first came into view. They were situated in a straight line, transverse, just above the omental attachment, and rather to the left of the centre of the organ. Two were anterior; the third posterior, and came out through the omental attachment. One other perforation of the stomach was found. This was in the lower edge of the right-hand portion, about three inches from the pylorus. All of these holes were bleeding pretty freely, and vomiting gastric contents. The posterior perforation was found only after several careful searches. Next, a linear rent of the transverse colon, just before it curves downward, was found. The tear was an inch and a half or two inches long, and through the omental attachment. All of these wounds were trimmed and sutured with Lembert sutures, of fine chromicized catgut, about an eighth of an inch apart.

The omentum was terribly torn in a number of places, and filled with very large extravasations of blood, which had become clotted. The clots were removed as thoroughly as possible, and one long rent corresponding to the colon wound was stitched by a continuous suture. A number of ecchymoses of the small intestine and mesentery were found; one of these ecchymoses of the intestine looked as if it would be likely to slough. This was turned in by uniting the serous surfaces of the bowel above it with the Lembert suture. The entire cavity was thoroughly searched, including the liver, gall-bladder, and spleen. The bullet could not be traced after leaving the stomach. The spinal and dorsal regions had been carefully examined for evidence of it there before the operation was begun.

Every portion of the abdominal cavity was then sponged and thoroughly irrigated with  $\text{HgCl}_2$  solution, 1 to 10,000, and the parietal wound closed without leaving in a drain, and dressed in the usual manner of the hospital. Time from patient's being taken from bed until put back again, two hours. Time from beginning incision to putting on dressing, an hour and a half.

After the operation the patient was somewhat shocked, but in an hour had reacted well, and was perfectly rational. He remained in this condition for four hours, complaining only of slight pain in abdomen. Five hours after operation he presented all the signs of hemorrhage, and rapidly sank; breathing much interfered with, and no radial pulse. He died in another hour—six hours from the completion of the operation.

*Post-mortem.*—Abdominal cavity contained about a pint of faintly blood-tinged serum; intestines congested; no additional or overlooked wounds found; the repaired ones in good condition and water-tight. Ball, after leaving stomach, penetrated diaphragm, and, without injuring the lung, struck the lower border of the seventh rib three inches anterior to its angle, chipping it and cutting the intercostal artery, which had bled a pint and a half into the pleural sac. The ball was found an inch and a half further along anteriorly in the same interspace.

The only point that I would add is in reference to finding the ball. As a rule, it is not found. In this case we traced it as far back as



the diaphragm, and thought that it might have gone through the edge of the spleen, but examination showed no wound of the spleen. The difficulty experienced in finding wounds of the upper portion of the stomach, where the omentum is cut and ecchymosed, is almost beyond description. It is a wonder that some of the wounds were not overlooked.

The next table to which I shall refer is that of stab wounds. In all the cases, with the exception of one, the wound was produced by a knife. In that one instance it was caused by a sharp splinter of wood. As we should expect, this table presents the most favorable showing. The total number of cases reported is 19. Of these, 12 recovered, and 7 died; a mortality of 36 per cent. These operations were done by 14 operators: 10 American and 4 foreign. The 10 American operators did 15 operations, with 8 recoveries, and 7 deaths. The foreign operators did 4 operations, and all recovered. The first case on record is that of Kwiectuski, of Russia, April 15, 1883. The first American one is that of Dr. W. O. Roberts, operated on August 28, 1885. The first recovery was the case of Kwiectuski. The first American recovery was the case of Dr. Roberts. The credit of the first recovery properly belongs to Dr. Roberts, of the United States, for the Russian operator had a large wound already made, which he enlarged to a certain extent, and sought for the intestinal wounds. Dr. Roberts had but the small opening made by a penknife.

I shall now read the histories of two cases:

CASE II.—G. W. J., aged forty, a powerfully built man, was admitted to the Pennsylvania Hospital, September 9, 1886, at 10.30 P. M. He had been stabbed by a long and narrow butcher's knife a few minutes previously, and had lost considerable blood. Had frightful pain in right side of abdomen; scarcely any shock. Upon examination a wound three-quarters of an inch long was found about two inches above the centre of Poupart's ligament on the right side; through it were prolapsed several inches of small intestine. Dr. John B. Roberts saw him in about three-quarters of an hour, and determined upon abdominal section. The operation was begun at once by making a five-inch median incision, strict antiseptic precautions being adhered to. The peritoneal cavity contained a large amount of dark fluid and clotted blood, while the intestines were almost wholly collapsed and empty. The prolapsed bowel was first reduced and then brought out through the operation wound and carefully examined, cleansed, and returned. The entire intestinal canal was thus examined, as were also the other viscera and mesentery.

This research revealed six wounds of the intestine and mesentery: namely, four wounds opening small intestine, one cut opening the colon just above the cæcum and running into the mesocolon, one transfixion of the mesentery. The wounds of the colon and mesentery were bleeding actively—the former permitted escape of bowel contents. The lesions of the small intestine were

occluded by prolapsed mucous membrane. All open wounds were about one-half inch in extent, and were closed with Lembert's sutures of silk. After repairing these injuries the abdominal cavity was thoroughly irrigated with hot 1:10,000 HgCl<sub>2</sub> solution, and then sponged dry. A glass drain-tube was put in as far as the rectovesical pouch, and the parietal wound closed with chromicized catgut. He reacted well, and was perfectly comfortable next day after the drain had been removed, for it caused great pain in the lower pelvic region. Previous to its removal, about six ounces of faintly blood-tinged serum came through it. No pain afterward. Its exit was stitched.

No food was given for three days, but bromide of potash, chloral, and brandy were administered in large doses, as delirium tremens was anticipated. Nutriments were begun on the fourth day, and gradually increased. Delirium then present, and on the increase. On the fifth day he seemed in a fair way to die from the great exhaustion incident to the mania. With Dr. Roberts's consent I determined to give strychnia to physiological effect—regarding that drug as indicated in the profound nerve exhaustion of delirium tremens. One-thirtieth of a grain twice daily by hypodermic was started, and the quantity rapidly run up until twitching, etc., became manifest. This did not occur until he had been taking one-tenth of a grain every hour, and a half for half a day. The same dosage was kept up for thirty-six hours and then reduced to one-tenth of a grain every fourth hour for another day, as that amount kept up the full effect, since he was becoming more and more sensitive to its influence.

He was thus kept, by smaller and smaller doses, in the full physiological effect of the drug for nine days; at the end of which time ten minims of tr. nux vom. could not be comfortably borne, and the drug was suspended entirely.

The effect upon him of this medicament was very marked indeed, and both Dr. Roberts and myself firmly believe that it saved his life. I have since tried this treatment upon similar cases with exceedingly good result.

Beyond the above his convalescence was uneventful. The belly healed by primary union. He was walking about his room on the fifteenth day, and in the yard on the seventeenth.

Discharged on the nineteenth day.

CASE III.—J. D., an Italian fruit-vender, aged thirty, was brought to the hospital at 1 A. M., December 25, 1886. He had received a stab during a broil some squares distant from the institution, and had walked all the way. Almost immediately upon receipt of the injury he vomited the contents of his stomach; not much pain was present, and that little was just around the wound, which was situate two inches to right, and three-quarters of an inch above umbilicus. *Decided emphysema was present* for a space of three inches all around the wound. Temperature, pulse, and respiration were normal. He was given a dose of morphia by hypodermic, and slept quietly until morning. There was no odor about wound, no signs of fluid in peritoneal cavity, nor diminution of liver dulness. At that time, 1 A. M., the wound, one-half an inch long, was cleansed, stitched, and sealed with benzine and collodion.

At 7 A. M., pulse, temperature, and respiration still normal, but much pain

was complained of, which seemed centred about the region of the wound, and was stated to be increasing and spreading every moment. Vomited green material.

It was decided to do an abdominal section, and at 10.30 A. M. the operation was commenced by Dr. T. G. Morton.

The original wound was first proved to penetrate—the intra-abdominal opening was not more than one-quarter of an inch long. Median incision was then done from two inches above umbilicus to within one inch of pubes, and the abdominal contents searched. A small amount of fluid and clotted blood ( $\frac{3}{8}$ ss) was found immediately beneath the stab wound. This blood was mainly entangled in the omental tissues. A rent of one layer of the omentum, about two inches long, was found in this region, also a divided and bleeding omental vessel just outside of the tear. The artery was ligated, and the tear sewn with catgut. The peritoneal opening of the stab wound was then closed by a single stitch of the same material. No other lesions could be found, as the cavity was carefully cleansed with sponges, and plentiful irrigation with warm 1:10,000 HgCl<sub>2</sub> solution, and the external wounds closed with closely placed interrupted fourteen-day catgut sutures. An antiseptic dressing and flannel bandages were applied, and morphia to mild narcotization administered. No drain was used. Strict antisepsis prevailed throughout. Time of operation, one and a half hours.

December 29th. The only annoying symptom from which he has suffered has been bilious vomiting from time to time, and which still keeps up in spite of various medicaments and champagnes, of which latter he has been taking  $\frac{f\frac{3}{4}}{j}$  every second hour; also has been taking  $\frac{f\frac{3}{4}}{j}$  of peptonized milk every two or three hours since 12.27 A. M. Dressed, because of disordered dressing yesterday, and wounds found united throughout.

Bowels opened last night, and again this morning, by enema. Urine had to be drawn twice following operation. Has had no special pain.

January 11, 1887. Up to-day and walking about. All sutures are away. No dressing on wound since January 8.

January 21st. Discharged cured; walked home; twenty-eight days in hospital.

The next table to which I shall refer is that of ruptured bladder, which has been to me, perhaps, the most interesting of the series. The total number of cases reported is 10, with 4 recoveries and 6 deaths, a mortality of 60 per cent. There were 9 operators—3 American and 6 foreign. The American operators performed 3 operations, with 1 recovery and 2 deaths. The foreign operators performed 7 operations, with 3 recoveries and 4 deaths. The first recorded case of abdominal section for ruptured bladder is that of Walters, of Pittsburg, in 1862. This case was also the first recovery. In Walters's case he diagnosed rupture of the bladder, with infiltration of the peritoneum with blood and urine. He opened the abdomen, cleaned it out, and put in a drainage tube, but did not sew the bladder wound. The second case was that of Alfred Willits, of London, operated on June 12, 1876.



This case died. The second American case was that of Dr. Bull, operated on October 27, 1884. This case also died. Two recoveries have recently been reported by MacCormac. Philadelphia has had one case, which was operated on by Dr. Joseph M. Fox, August 16, 1886, with fatal issue. I will read the report of this case:

CASE IV.—E. M., a man aged thirty-eight, at one A. M. on August 16, 1886, walked out of a second-story window. Two and a half hours afterward he was admitted to the Pennsylvania Hospital. He had been drinking much the previous evening, and the bladder was distended at the time of accident. Upon examination, the resident surgeon, Dr. Alexander McAllister, found that the neck of one femur was fractured, and that he had marked symptoms of ruptured bladder, namely, great pain over bladder and lower abdominal region; intense desire, but no power, to micturate; bloody urine by catheter. He was much shocked, but had recovered by nine A. M., when he was in good condition. Dr. Fox at that time saw him, confirmed the diagnosis, and determined to operate, but through the intervention of circumstances beyond his control was prevented from so doing until evening, when the operation was performed.

Strict antisepsis prevailed. A four-inch median incision was made over the bladder. Ten ounces of blood and urine were found in the peritoneal cavity. Intestines congested, and in places looked almost gangrenous. A two and a half inch triangular opening was found in the anterior portion of the fundus. The viscus was held up by two long sutures passed through the sides of the rent, and the wound was then sewed with closely placed Lembert sutures of catgut; fifteen were introduced. It did not leak when distended with 1:1000  $\text{HgCl}_2$  solution. The abdominal cavity was then thoroughly washed with 1:5000 solution, and the parietal wound closed, leaving in a bone drain tube down to the bladder; but, of course, not entering that organ. A rubber catheter was left in the urethra. He died in forty-two hours.

Post-mortem examination showed localized peritonitis about wounds. Wound of bladder water-tight. Blood clots in pelvic basin.

Now a few details with reference to ruptured bladder. The symptoms of ruptured bladder are more definite than those of most other cases. The condition of the bladder at the time when the injury is received is of some importance, but cannot always be ascertained. Shock is usually present, as in other cases. Pain in the hypogastrium, fruitless efforts at micturition, vomiting, hiccough, distention of the abdomen with fluid, the withdrawal of blood or bloody urine by the catheter, are all good indications. If there is no urine in the bladder, or none comes in, it is a fair sign. The catheter can sometimes be introduced to a great length, and occasionally the rent in the bladder wall may by this means be detected. The withdrawal of an enormous quantity of fluid is another indication. If warm water is injected, it may be felt by the patient in the loins and other locations. With the



catheter in the bladder, the liquid sometimes ebbs up and down with the movements of respiration. Recently Dr. Weir, of New York, has suggested a test for ruptured bladder, which consists in injecting a certain amount of fluid and percussing over the region of the bladder. If a definite outline of percussion dulness is noted, it is a fair inference that the bladder is not ruptured.

It is important to determine whether the rupture is extra- or intra-peritoneal. Stephen Smith has shown, in a collection of 65 cases, that the peritoneum is injured in 80 per cent. of the cases. Max Bartles found, in an examination of 166 cases, that the rent was intra-peritoneal in 98, and extraperitoneal in 54. In 84 cases of intraperitoneal rupture the rent was situated at the fundus in 40 cases; in front, near the fundus, in 9; posteriorly in 33; and at the side in 2 cases. In 50 cases of extraperitoneal rupture, the rent was at the neck in 19, anterior in 23, posterior in 2, and at the side in 6. In 15 of these cases there was fracture of the pelvis. In these cases, as a rule, the urine found in the peritoneum is healthy, and not decomposing. An interesting paper has been published by a Russian, giving the toxic effects of urine which has escaped into the peritoneal cavity.

The method of operating is an interesting one. Having determined upon interference by section whether the diagnosis has been made positive or not, a median incision should be made and enlarged to suit the convenience of the operator. The incision may at first be made down to the bladder, as for a suprapubic lithotomy. If there is a wound in front, you may feel it if it enters the peritoneal cavity; but even this is fallacious. Having found the wound in the bladder, the first thing is to clean the peritoneal cavity. Next, it is necessary to get the bladder into a position to suture it. This has been, until recently, found one of the most difficult steps of the operation. To obviate this, distention of the rectum with a colpeurynter has been practised. More recently, as in the case of Fox, sutures have been introduced on either side, and may be combined with the use of the colpeurynter. MacCormac, who found considerable difficulty in bringing up the bladder, made a lateral incision on each side through the peritoneum. This liberated the bladder immensely. These peritoneal wounds he stitched together in the usual way, but it appears to me that this might be improved upon by introducing the stitches as Dr. Emmet does when sewing up his relaxation incisions of the vagina or elsewhere—that is, by uniting the wound by stitches passed in its longitudinal diameter. It has been found that the cases in which the

sutures penetrate all the coats of the bladder invariably terminate fatally. This must be borne in mind, and the sutures passed through only the serous and muscular coats. The bladder wound is to be brought together with Lembert sutures of silk or catgut.

The after-treatment brings up the question of drainage, which has been discussed. A catheter should be left in the bladder. Another important thing is to prove that the stitches effectually control the opening in the bladder. This is done by injecting some solution—better, a weak antiseptic solution—into the bladder. If there is any leakage, additional sutures should be introduced; or the first row of stitches, by a second set, turned in.

The last division of the paper relates to rupture of the intestine. The total number of cases reported is five, of which number none recovered. One operation was performed in America and four abroad—two in Australia, one in France, and one in England. The first recorded case is that of F. H. Girdlestone, of Australia, February 14, 1883. The only American case recorded is that of Dr. E. A. Wagner, on August 2, 1886. One case fell, and pressed a truss down upon a descended hernia; one was thrown from a horse; two were kicked in the abdomen; and one was crushed by a horse. In five cases the small intestine was ruptured, and in one the colon was the part involved. I have the notes of one case of ruptured intestine which occurred in my father's wards in the Pennsylvania Hospital. I wish, in conclusion, to relate it, although it was not an operative case.

CASE V.—B. R., aged fifty-seven, was brought to the Pennsylvania Hospital, a distance of ten miles, on a bitter cold night, sitting in an upright position. Upon his arrival he was in a state of collapse, from exposure, cold, pain, and weakness. He stated that he had long been subject to a hernia (indirect inguinal) of the right side; that he habitually wore a truss that did not keep it reduced properly; and that while it was down, about thirty hours before admission, he had been violently kicked in that groin. He experienced some pain and nausea at the time, and both steadily increased up to the time of his admission. His bowels had not moved.

Upon admission his condition was as above; no vomiting or belly pain. A large swelling was present along the proper position of an indirect inguinal hernia. In this lump he had severe pain. All endeavors were directed to bringing him out of his shocked condition.

Dec. 3, 1886. Late last night he had reacted sufficiently to receive an anæsthetic, which was administered, and a thorough examination of the affected region made. No hernia was present; simply a mass of inflammatory exudation. Considerable emesis and some recurrence of shock followed. This morning his condition seemed fair. He stated that he had none or very little pain; took liquid nourishment; and had his bowels freely moved by enema; *no abdominal symptoms whatever.*

In the afternoon he vomited, several times, material with a suspicion of fecal odor about it, and during the night it became very markedly so. It now became evident that he was suffering from one of three conditions, namely, either a ruptured gut, a reduced though still strangulated hernia, or an intussusception.

4th. The first thing this morning preparations were made for opening the scrotum, and, if necessary, the abdomen; but the anæsthetic so depressed him, and his condition within the last few hours had become so bad, that the operation had to be abandoned. He died in the course of a couple of hours.

*Post-mortem.*—Upon incising the scrotum a quantity of fecal material was found; no hernia was present, but the internal ring was patulous. The peritoneum was found in a state of general peritoneal inflammation, and a great quantity of fecal fluid material was present in the pelvic basin. A loop of small intestine, having an inflammatory ring about its neck, was found in a state of almost gangrene, from congestion and inflammation; while the loop was torn for an inch in extent in two places; the communication of the loop at both ends with the normal bowel was present, though the opening was small. Post-mortem examination otherwise negative.

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## DISCUSSION.

DR. C. B. NANCREDE said: I understood Dr. Morton to say, that the case of suture of the intestine for ball-wound which he reported was the first so treated in Philadelphia. He is mistaken, for I operated on a case of gunshot wound of the abdomen some seven months ago, and reported it to the Academy of Surgery about three months ago. I should like to compliment Dr. Morton on the immense amount of labor evidenced by his paper. I think this is a timely subject for discussion. Some three months ago I had the privilege of taking part, by special invitation, in a discussion on gunshot wounds of the small intestine, which took place in New York; and was participated in by most of those who had operated up to that time. The conclusion arrived at was that all penetrating ball-wounds of the abdominal cavity demand at least an exploratory operation, and if any wound of a viscus be found its repair should be attempted. I should like to enter a protest against the evident tendency to advise the opening the abdominal cavity by any practitioner in every ball-wound. Where a large tumor has been removed the abdominal walls are lax, and there is plenty of room for manipulation. In laparotomy for gunshot wounds or other injuries, the difficulties are tenfold. You have to operate through a tight and narrow opening. In prolonged operations there is often difficulty from distention of the intestines. The difficulties in finding the wound are sometimes exceedingly great, so much so that if I had a ball-wound in the abdominal cavity, unless I could be operated on by one who was in the habit of doing abdominal operations, I should rather trust to the old let-alone plan. I have seen undoubted penetrating ball-wounds of the abdomen recover.

Let me say a few words about my own case which, I think, shows the important point, although I could not secure a post-mortem, that peritonitis is



not the only thing we should dread. I saw the boy six hours after he had been shot. The wound was a little to the left and above the umbilicus. He vomited blood one hour and a half after admission, although the operation showed that both the anterior and posterior walls of the stomach had been perforated. I determined that the wound was a penetrating one and made an incision in the median line; and I would warn any against enlarging the existing wound if not in the median line. I found a wound of the anterior wall of the stomach which I closed with fine silk, using a fine sewing needle. Then I found a wound in the anterior wall of the duodenum which I sutured. I next looked for and found a wound of the posterior wall of the stomach. A large ragged wound in the posterior wall of the duodenum was also discovered. Examination from the stomach down almost to the ilio-cæcal valve revealed no other wound. A careful toilet of the peritoneum was made and the wound closed. The boy did well for forty-eight hours and never presented the least symptom of peritonitis. When peritonitis comes on suddenly there may be a profound condition of shock which will not admit of rise of temperature, rigidity of the abdominal muscles, flexion of the limbs upon the pelvis, pain, or any of the usual symptoms, but this is not the case in slowly developing peritonitis. The boy died on the third day with a series of convulsions with very high temperature. I believe that he died of sapræmia, due to the absorption of ptomaines. The cold water coil, which was used almost from the outset in both of the successful cases of Bull, of New York, was not used, and I think more opium was given than was wise. We have long been taught to give opium in full doses in traumatic peritonitis, but I believe that many cases are killed by this treatment. When the initial symptoms are marked by collapse, low temperature, rapid, feeble pulse, and clammy skin, if you give large doses of opium simply to ward off the expected inflammation, you will probably kill the patient. If you give moderate doses of morphia with large doses of atropia, you will possibly rally the patient and carry him over the shock stage. I think that large doses of opium should not be given in peritonitis unless guarded by atropia. It should be given by hypodermic injection, for you do not know how much will be absorbed from the stomach. At the end of a peritonitis where, from the respiratory centres becoming involved and from interference with the action of the diaphragm by tympany, hypostatic congestion of the lungs is taking place, persistence in the use of large doses of opium will kill the patient. If the opium is reduced to a minimum and given with large doses of atropia, or atropia is alone exhibited, you will sometimes tide the patient over.

I think we should enter a word of warning against the tendency to operate on every case of abdominal wound without proper precautions. It should be done by a skilled hand. Not every case is fitted for it. The condition of the patient should be carefully considered before such an operation is attempted, and I hope the Society will be careful how it endorses an operation of this kind as the *rule* for penetrating wounds without further light upon the subject.

DR. S. S. COHEN said: Dr. Morton has spoken of the injection of hot water into the abdominal cavity for the purpose of restoring the pulse in cases of severe shock and collapse. It may be interesting to mention that Dr. Benjamin Ward Richardson records successes following injection of hot milk into



the abdominal cavity for the purpose of restoring patients in the collapse of cholera. The same measure has been used successfully by others.

Dr. Morton also stated that he knew of no case in which poisoning with boric acid had occurred. Such a case has been reported in *The Medical News*, some two years ago, by Dr. Brose, of Indiana.

DR. G. G. DAVIS said: We have been taught that penetrating wounds of the peritoneum are not to be probed. The author has mentioned this as one of the means of diagnosis. If other diagnostic points are present, probing is not necessary; still, I think it justifiable to use the probe if it is done antiseptically. The time of probing was not touched upon. This, I think, is a very important point. When called to see a man who has been shot in the abdomen or any other part of the body, the question arises whether or not it is justifiable to probe the wound at once. I believe that it is not; unless certain precautions are taken and unless the surgeon is prepared to follow up his examination, if necessary, by operation. If there is hemorrhage it requires attention. Outside of that I can conceive of no circumstance which will require immediate manipulation of the wound. The examination should be deferred until the patient is brought to the hospital or to his home and the examination made once for all, at the time when the surgeon is prepared to go on with the operation, if one is necessary. The indiscriminate examination of Garfield's wound was severely criticised by Esmarch, and he had good grounds for his criticism. I have not seen many cases of gunshot wound, but I can recall three cases in which the abdomen was involved. In none of these was any operation performed, and they all speedily died. If the operation is to be done, it should be done early. The cases which I have seen remained in a comparatively good condition for a few hours, but toward the end of the first or second day many of them will die, particularly if the wound is a large one. They seem simply to sink away.

As regards the use of hot water injected into the abdomen, a less radical method is the injection of the hot water into the rectum, which is frequently used and which I employed at least six years ago. A temperature of 108° to 110° will be found comfortable.

DR. MORTON said: In regard to Dr. Nanerode's remarks, they are practically covered by what I have already said. The question of what cases should be operated upon, and by whom, is still under judgment. It would seem to be the judgment of the majority that all cases of penetrating wounds should be opened. The probe would only be used where you are prepared to operate if necessary. In many cases the ordinary signs of peritonitis are perfectly worthless. The case of ruptured intestine which died presented no apparent symptom of peritonitis.

In those cases where intraperitoneal injections have been made in cholera, it has been on account of the empty condition of the bloodvessels. Here it is commended for the treatment of shock, pure and simple. It is simply the application of heat. The use of hot enemata has long been practised in the Pennsylvania Hospital, but it is not so satisfactory as large hot water irrigations at a temperature of 100° to 110°.

With regard to the question of mortality, the table shows the total mortality of cases reported. It is probable that the real mortality is even larger. Every successful case has doubtless been put on record, while it is likely that many

unsuccessful cases have not been published. The table also includes the first cases operated upon, and I think that the next three years will show a great change in the mortality. It will probably get to and remain at about fifty per cent. Many of these operations were performed without the knowledge of abdominal surgery which we now have, and many of those who operated may have had no experience with abdominal work.

Most of these cases of traumatism involve the question of murder. If we save thirty per cent., perhaps fifteen of these will be murder cases, and on the life of each of these patients would depend that of another person, so that we should really save forty-five lives.

## A CASE OF SUPPURATIVE INFLAMMATION OF THE LIVER IN A CHILD TWELVE YEARS OF AGE; OPERATION AND RECOVERY.

By GEORGE W. VOGLER, M.D.

[Read, February 9, 1887.]

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M. C. S., a bright, precocious school-girl, of rather delicate and frail build, dark-complexioned, and tall, presented the following history :

On October 7th she first complained of intermittent pain immediately over the right hypochondriac region, corresponding to the right lobe of the liver, and at the same time began to favor the part by slightly bending forward and to the right side when standing or walking. There were apparently no other symptoms present—at least she complained of none. This state of things continued for about a week, the little patient continuing her school duties, although with much suffering and inconvenience. She now refrained from going down to recess with the other children. The pain became more severe, especially at night, producing great restlessness, and interfering with sleep. The stooped condition of the body was now permanent; walking was discontinued owing to pain; and some fever (at night particularly) also manifested itself, with marked impairment of appetite, coated tongue, thirst, cloudy urine, and constipation.

Both the mother and child, after several careful examinations of the part, found nothing to account for the trouble. In the meanwhile, a physician in attendance upon another member of the family was asked to look at the child. He examined her several times, but found nothing of note, and pronounced the case as probably a strain, or one of cold, for which he ordered a plaster, and citrate of magnesia for febrile disturbance. The child continued to grow worse daily, and the same physician ordered a fly-blister to the affected part. It may be mentioned just here, that the pain never shifted, but was always confined immediately over the area corresponding to the right lobe of the liver. Flaxseed and onion poultices were ordered to be applied by the medical gentleman upon noticing later a slight swelling over the seat of pain. Upon November 12th, five weeks after the commencement of her illness, I assumed charge of the case. I found her in bed, greatly reduced in flesh, with an anxious expression and suffering intensely. Her favorite position was a sort of sitting posture, with the body bent forward and to the right, and with the lower limbs flexed strongly upon the abdomen. The symptoms

already described were very marked; also irregular attacks of chilliness or rigors; temperature was elevated every night; there was no cough, jaundice, or vomiting; there was, however, sallowness of the skin, and dark, turbid, and scanty urine.

Examination revealed a dark bluish swelling some three inches in diameter in the right hypochondriac region, bordered by the sixth rib above; the tenth below; the linea mammaris (a line extending perpendicularly downward from the right nipple), upon the inside; and the linea axillaris, on the outside. The swelling was about three-quarters to one inch in height, and presented all the appearances to sight and touch of a carbuncular development. It was hard, firm, and quite painful to the touch. There was no fluctuation. My first object was to ease the child of her cramped and painful position in bed by encouraging her to occupy a rocker, or, if possible, to walk about the room a little. She was put upon concentrated nourishment, stimulants, and, medicinally, on syr. ferri iodidi, and bromides and chloral for the pain. The latter remedies had to be early replaced by opiates and quinine, owing to their inefficiency to combat suffering. Temporarily, I ordered an ointment applied every eight hours, composed of camphor, opium, ext. belladonnæ, comp. resin ointment, and cosmoline.

This plan of treatment was continued for five or six days, with the effect of markedly softening the swelling and causing it gradually to diminish in size, and the development of a central point of concentration just over the eighth intercostal space. I thought I detected fluctuation on palpation, but obtained nothing but blood on aspiration with the exploring needle.

At any rate, the child seemed easier and more comfortable. Anodyne flaxseed poultices were now started, and on the 21st instant I prepared to operate, all the conditions seemingly pointing to the retention of deep-seated pus. Contrary to the usual custom, I determined to treat the case by free incision, the thorough evacuation of the pus (if any), and the prevention of reaccumulation by complete drainage by means of rubber tubing.

The little patient was thoroughly etherized, and, after selecting a favorable point by the aid of the exploring needle, a free opening was made, one inch or more in length, down through the eighth intercostal space, about one and a half inches to the right of the linea mammaris. Immediately, about eight fluidounces of pus flowed from the wound. At first the pus was "laudable," free from odor, but streaked or marked with biliary coloring matter; toward the end it assumed the very dark condition usually spoken of as "chocolate-colored pus," due to the presence of blood or disintegrated hepatic tissue. Gradual pressure over the hepatic area aided in its rapid and free evacuation, the bulging over the intercostal spaces disappeared, and for the first time the outlines of the ribs were readily recognized. A probe was now passed through the wound under the ninth rib, and it entered in an obliquely downward direction to the extent of four inches, toward the linea alba, and three inches obliquely upward toward the sternum, in depth perpendicularly about two and a half inches.

A perforated rubber drainage tube doubled upon itself, was introduced into the depth of the cavity, enabling free drainage; and the daily injection of carbolized oil (two to sixteen fluidounces) through one end, and its escape through the other. Warm cataplasms were continued night and day. After



some five days the tube was replaced by one of a smaller calibre, and entirely done away with the ninth day after the operation. A small piece of lint dipped in carbolized oil was used a few days longer, simply to keep the cut from closing and insure thorough healing from within outward. Finally, carbolized zinc ointment completely healed the wound by December 8th. Her improvement and rapid convalescence after the operation were wonderful. Internally she has been taking cod-liver oil emulsion with hypophosphites and syrup. ferri iodidi.

December 12th, she was walking and playing about her room. Of course, the marked constitutional depression due to her serious ailment will to a considerable extent continue for some time, but there is at present no doubt of her entire recovery of good health.

Later, January 15, 1887, the child is well and fully recovered.

REMARKS.—Let us notice briefly some of the very interesting features presented by this case. The first thought worth noting is the tender *age* of the patient, viz., twelve years. The statistics show this serious ailment to be rare in children, being seldom seen under the age of twenty.

In seeking for the *cause* of the disease in this case, I am led to adopt one of a traumatic nature. Frerichs, Budd, Andral, Romis, Morehead, and others, in their collection of cases, show but a very small percentage due to external violence. Thus, Budd reports only 2 out of his 62 cases collected; Morehead, but 4 out of his extensive observations—318 in all. After the closest questioning my little patient revealed no previous malarial, dysenteric, metastatic history, or any other inflammatory and ulcerative process in the gastrointestinal canal, which are generally looked upon as the chief disturbing influences or causes of suppurative inflammation of the liver. Careful inquiry elicited the following history and probable cause:

About four days previous to the commencement of her symptoms, she assisted her aunt in carrying flower plants from the yard up to the fourth floor of the house. One of these plants was, owing to its weight, entirely beyond her strength, yet, after four efforts, she succeeded in landing it on the fourth floor. She described very vividly the pain felt by the pressure, and the weight sustained over the right hypochondriac region in her struggles to complete her task. As before said, the child is of a very slight build and delicate, and it is quite probable that this external violence originated her painful affection.

A few words as to the diagnosis, prognosis, and treatment. I found much difficulty for a time in arriving at a satisfactory conclusion as to the *diagnosis* of the disease, and was inclined for some days to believe the case one of unusual carbuncular development, dependent upon

a very badly run-down system, and having its starting-point in the mechanical violence or external contusion referred to above. Even the exploring needle failed me in establishing a positive conclusion. It was only definitely arrived at in doing as Frerichs so aptly puts it: "In most cases a correct diagnosis will only be arrived at, by not relying upon individual symptoms, by taking a general view of the mode of origin and entire clinical history of the case, and, after excluding by comparison the diseases of the liver and of the neighboring parts, which may give rise to symptoms similar to those of hepatitis."

It is well understood that the prognosis is generally unfavorable in suppurative hepatitis. Frerichs says: "Suppurative hepatitis belongs to the class of severe maladies which imperil life, and which terminate in death far more frequently than in recovery." And this naturally leads to the consideration of the treatment. I candidly believe from the presence of the grave symptoms, that my patient would have died in a short time but for the prompt and energetic operation undertaken as soon as a reasonable conclusion could be arrived at concerning the diagnosis. Even when there is considerable doubt existing and the condition of the patient is serious, careful exploratory incision could be made to determine the true state of affairs. No danger can result from this when proper precautions are used. At any rate, the aspirator should be early used as a means of establishing diagnosis. Drs. Sims, Hammond, Jimney, of Mexico, and many others, have frequently punctured the liver without any bad results.<sup>1</sup> It has been demonstrated time and time again, that the entrance of air into such a cavity through an incision is not necessarily attended by decomposing action and death, but, on the contrary, a complete evacuation is obtained, reaccumulation prevented, and the threatened death by exhaustion or blood-poisoning averted. Upon the other hand, imperfect removal of the pus by one or more aspirations or punctures, permitting more or less to remain behind, will, in addition to that constantly forming, undoubtedly keep up the constitutional disturbances, and, finally, produce a fatal issue by rupture or blood-poisoning, if the very rare act of absorption does not take place.

The case treated of in this paper happily illustrates the good results of free incision, perfect drainage per tube, and the rapid healing and antiseptic properties of carbolized oil. The method of gradually

<sup>1</sup> Since completing these remarks, I notice in the January 1st number of *The Medical News*, a report of a "Case of sudden death from the introduction of an aspirator needle," by Dr. Reeve, of Dayton, Ohio.

opening the abscess as recommended by Récamier, Begin, and others, by the separation of a slough through many applications of caustic potash or soda, is very slow in operation, painful, productive of loss of tissue, and if an opening into the pus cavity is finally established air must also surely enter. Again, many abscesses of the liver open spontaneously, and though air freely enters the cavity, the patients usually go on to rapid recovery. In fact, this latter mode of termination of the disease (spontaneous opening), is very much welcomed by the physician and has eminent advocates. I should not think after the excellent result obtained, of treating similar cases by any other plan than the one suggested. Lives are undoubtedly lost by the partial or imperfect method of removal of foreign material by repeated aspirations or punctures, thereby necessarily keeping up the source of trouble which eventually must end in death. The early and prompt operation happily terminated my case in recovery in about fifty days, while Rouis, in his valuable and extensive statistics, shows the average duration of the disease in cases *not* operated upon, and which recovered by bursting either through the thoracic or abdominal walls, through the bronchi, colon, or stomach, to have been 140 days.

## DISCUSSION.

DR. C. M. SELTZER said: I have seen three cases of abscess of the liver, and in these cases the symptomatology was somewhat different from that of the case described. I should think that an abscess of the liver holding eight ounces would produce more constitutional disturbance than was present in this case.

The destruction of liver structure is usually greater, and the case, as a rule, requires a longer time for recovery. The three cases which I have seen all resulted fatally, and at the post-mortem the liver tissue was found to be very ragged, and hanging in shreds in the abscess cavity. In these cases the diagnosis was readily reached by a microscopical examination of the pus. The liver cells could be easily detected. That, I think, should have been the mode of determining whether the case were really one of hepatic abscess or not.

DR. J. S. NEFF said: It is well known that pus from a hepatic abscess rarely contains liver debris, because most abscesses in this situation are surrounded by dense walls of pyogenic membrane. The cases to which Dr. Seltzer has referred, in which the liver substance projects in shreds into the abscess cavity, are cases of diffused abscess, which are very rare.

In the circumscribed abscesses of the liver which I have seen, the tendency



to point has been in a different direction from that in the case reported. I have seen only one case in which the abscess was opened through the abdominal walls. That was the case of a man in the Jefferson Medical College Hospital. The abscess was tapped a number of times, but as the man was evidently sinking, it was decided to open it through the abdominal wall. One of the dangers of this operation is that pus may escape into the abdominal cavity. In performing it, some operators at the first sitting cut down to the peritoneum. In the course of twenty-four hours there will have been some local peritonitis with the formation of adhesions, and then the operation is completed. Dr. J. M. Barton operated in my case, and after cutting through the abdominal wall with a scalpel, a white-hot knife was used in order to avoid hemorrhage from the liver structure. After the liver had been penetrated a short distance, the knife failed to act satisfactorily, and the operation was completed with a soft gum catheter.

In the case reported, the cause of the affection and the youth of the patient are also points of considerable interest.

DR. SELTZER said: My remarks were based on the statement that this was an acute diffused hepatic abscess, and not one surrounded by pathogenic membrane.

DR. VOGLER said: I have no doubt whatever as to the diagnosis of this case. The situation of the abscess, the fact that the pus was mixed with biliary matters, the fact that the finger could be introduced through the cut two inches under the ribs, and the very grave constitutional symptoms, were sufficient to indicate the seat of the disease. I unfortunately neglected to make a microscopical examination of the pus. As Dr. Neff has said, it is not necessary that disintegrated hepatic structure should be found, for many of these abscesses are localized. I thought that in all probability adhesion had formed between the abdominal wall and the liver, and in operating I experienced no trouble.



# A CASE OF PERFORATING ULCER OF THE STOMACH, WITH CHRONIC PERITONITIS.

BY JOSEPH S. NEFF, M.D.

[Read February 9, 1887.]

ALFRED R., colored, stevedore by occupation, forty-five years old, was admitted to the Medical Ward of the Philadelphia Hospital, December 12, 1886. The family history was indefinite; he had had the ordinary diseases of childhood: pleurisy when about nineteen, enteric fever a few years later; says he had relapsing fever about twenty years ago, since which time he has often had pains and stiffness in the joints, but not severe enough to prevent him working. During the last year he has had occasional attacks of indigestion, rarely accompanied by nausea and vomiting. Last spring he vomited blood; had sensations of burning heat in the stomach, and other evidences of indigestion, with extreme acidity of the stomach; there was very little pain until the latter part of July or the first of August, at which time it was confined to the abdomen (?), and was constant, but more marked after eating. From this time he vomited after almost every meal, and it was not long before he could retain only liquid food. At first the vomited matter was simply the undigested food, later small quantities of a slimy, watery fluid as well. From that time up to admission he vomited blood, dark in color, small in quantity, but once or twice.

Does not remember any sudden onset of pain, chill, or any symptom pointing to perforation of the stomach, or acute peritonitis. His weight last winter was one hundred and ninety pounds, but at date of admission he was much emaciated; he complained of severe and constant pain over the upper portion of the abdomen, especially in the left hypochondriac region, not being able to bear the slightest pressure. There was a small prominence, slightly firmer than the rest of the abdominal wall, situated below the margin of the ribs, one inch to the left of the median line, ovoid in shape, the horizontal diameter being three inches, the vertical diameter two inches in length. Over this area the percussion note was somewhat dulled—*i. e.*, on light superficial percussion; the motion of the diaphragm was not imparted to the mass. He referred to this point as the source of pain which radiated over the entire abdomen and through to the back.

Physical examination showed the heart to be of normal size, first sound absent, second accentuated, more marked over aortic valve; no murmurs were heard; the temporal and radial arteries were firm and hard, not compressible, with no perceptible pulse in the wrists. A systolic bruit was heard posteriorly over the thoracic aorta.

The lungs were normal, but many mucous râles were audible in the bronchial tubes. No increase in the liver or splenic dulness could be made out, as he could not bear any pressure below the diaphragm. His general condition improved somewhat for a short time after admission; the pain, however, remained constant, and vomiting was of frequent occurrence. He died of exhaustion on January 1, 1887. During the time he was under observation no change of note occurred. The temperature ranged from normal to 99.5°. He vomited blood once only, on December 15th, small in quantity, and dark in color. Paroxysmal spasm of the diaphragm commenced December 16th, and continued with intermissions until death. A loud systolic murmur was detected on the 19th, with area of intensity over the apex. The urine remained normal throughout, and much reduced in quantity; of high color; specific gravity 1.032; reaction markedly acid; no albumen or sugar. The diagnosis was made of cancer of the pyloric end of the stomach with secondary peritonitis, induration with inflammatory infiltration, and adhesions between the diaphragm and the stomach.

**AUTOPSY.**—Body much emaciated. Abdomen scaphoid.

*Thorax:* Lungs normal, except hyperæmia, and firmly adherent to the diaphragm; no other pleural adhesions. Heart: Pericardial sac obliterated by adhesions; left ventricle large, firmly contracted; right ventricle small, and partly filled with a firm clot; valves normal; aorta showed marked chronic endarteritis throughout its whole thoracic portion, and extending to abdominal aorta; left ventricle was small, wall thickened, red, and firm.

*Abdomen:* Peritoneal cavity contained a quantity of purulent (?) matter. Peritoneum inflamed, the coils of intestine extensively adherent to each other, and to the liver, spleen, stomach, and diaphragm. There was a sac formed at the hilus of the liver by adhesion of the duodenum with the gall-bladder and under surface of the liver. This cavity contained purulent (?) fluid with thickened walls. The gall-bladder was flattened from pressure, and contained a small amount of thickened bile. The mesocolon showed inflammatory thickening. The upper surface of the liver was extensively adherent over the right lobe to the diaphragm. The left lobe was intimately connected with the stomach. There was a cavity formed by the anterior surface of the left lobe of the liver, the anterior surface of the pyloric end of the stomach with the diaphragm forming its roof. The right wall of the cavity was formed by the suspensory ligament of the liver, the anterior wall by adhesion of the liver and stomach, the left wall by adhesions between the diaphragm and the anterior wall of the stomach. The cavity was filled with a grumous material, its walls being indurated and inflamed. In the floor of the sac there was an opening a half inch in diameter through the anterior wall of the lesser curvature, about half way between the cardiac orifice and the pylorus, and a half inch to the left of the left edge of the left lobe of the liver. There was also another sac formed by adhesions between the diaphragm, spleen, and cardiac end of the stomach. This cavity had no communication with the one just described, or the stomach; it contained a similar fluid.

*Stomach:* Walls were greatly thickened, more marked at the lesser curvature. In the neighborhood of the perforation noted the wall was thinner, the orifice presenting a rounded edge. When opened, the mucous surface throughout appeared greatly ridged and mammillated, general thickening being most

marked at the pylorus. There was no indication of neoplasm. *Spleen*: Adherent throughout its whole surface, very small, firm, with dark red fibrous pulp. *Liver*: Right lobe large, the left being small; flabby cut surface showed a slightly congested parenchyma. *Pancreas* normal. *Kidneys* were firm, cyanosed, normal in size; capsule slightly adherent; some small cortical cysts; thinning of cortex, and interstitial thickening.

The point of interest clinically is in connection with the diagnosis from malignant disease. The constant character of the pain, the persistency of the vomiting without remissions, the small amount and character of the hemorrhage, the gradual loss of flesh, with apparent cachexia, and the presence of a painful, non-fluctuating tumor, would warrant a diagnosis of cancer. I should mention, too, the presence of constipation as being of some value. The circumscribed cavities noted were the result evidently of inflammation from the passage of the contents of the stomach into the peritoneal cavity, the secondary adhesions binding the organs together in such a form as completely to shut off the small cavity in the left side from any outlet, while the larger in the right side still had direct connection with the interior of the stomach. The immobility of the tumor upon deep inspiration was undoubtedly due to the fact of the diaphragm itself being adherent to the chest-wall over a considerable extent of its surface, and therefore having very little play during the respiratory movements.

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## DISCUSSION.

DR. H. F. FORMAD said: Dr. Neff's case is of interest from the fact that the patient's life was considerably prolonged by the formation of a sac which retarded the development of peritonitis after the rupture of the ulcer. It is also interesting from the fact that it occurred in a male. In twenty-two cases of gastric ulcer in which I have made the post-mortem, in seventeen the subjects were females. This agrees with the experience of others. Gastric ulcer is not rare, but many cases are overlooked because physicians open the stomach through the smaller curvature, where the ulcer is frequently situated. In the majority of cases that I have seen, the death was sudden, being due to perforation. In some the death was apparently due to shock, the whole of the contents of the stomach having in many instances escaped into the peritoneal cavity. Death occurred before there was time for the establishment of inflammation. In some cases there was free hemorrhage, and in one case there was a complete blood-cast of the stomach. Some of the cases that I have seen were in drunkards, some were in hysterical women, and some in the insane. Three of my cases came from the Insane Department of the Philadelphia Hospital. Dr. Dercum informs me that he has met with several cases of gastric ulcer among the inmates of the Norristown Insane Asylum.



# RESULTS OF SOME GENERAL WORK IN ABDOMINAL SURGERY, PERFORMED DURING SEVEN AND ONE-HALF MONTHS OF 1886.

By HOWARD A. KELLY, M.D.

[Read February 9, 1887.]

THE notes of cases here offered for your consideration were collated at very short notice to fill a vacancy in the evening's programme. This explanation, however, I do not intend as an apology, for the subject is one of extreme importance, in which, as a specialist, all my own interest is concentrated; and I believe that I shall be able, in a few minutes this evening, to draw your attention to a list of cases remarkable for its variety, including one or two topics quite new.

Many here to-night remember the time when the large cystic ovarian tumor was considered the only indication for abdominal section, and, if other conditions were accidentally discovered, the incision was simply quietly closed. The dangers of the operation itself were so great that surgeons were loath to interfere until the patient's wretched condition seemed to warrant the risk.

As, however, our race cultivated a familiarity with the peritoneal sac, and learned its limits of toleration and intolerance, a bolder and more successful work was entered upon. With dropped pedicles, innumerable ligatures for hemorrhage, peritoneal toilet, drainage tube, and, above all, an unremitting care to secure *microscopic* cleanliness throughout, we have become masters of the situation, and our failures, when they occur, are no longer *mysteries*. And with these improvements has come a recognition of a greater variety of indications for abdominal section, until, as to-night, I am able to present, out of twenty-eight successive cases, at least nineteen separate morbid conditions. Before calling your attention to the list of my cases (which shall be only cited briefly by name), I would ask you to consider with me a few important points bearing directly upon the work.

In the first place, as to *percentages*. While I have a personal pride

in my work which induces me to say that it will bear the strictest criticism, yet I cannot but deprecate the bitter spirit which animates so much of the percentage discussion. The time *was* when, by this means alone, by means of the striking differences which existed, we were enabled to determine, in the absence of personal experience, the relative value of *methods*; but that time has *passed*, and with the closure of the chapter on ovariectomy, this spirit of emulation survives no longer in the interest of *science*, but is *personal* and unworthy of our cause. Further, it is manifestly absurd to compile statistics from a class of heterogeneous cases.

In the removal of small tumors in the pelvis, in the removal of ovaries and tubes not to the naked eye diseased, we are most often compelled to operate for *pain*. The patients themselves, *seeing* nothing amiss, are very loath to submit to "being opened" until their misery makes life a burden—at least this has been my own experience with women, to whom I always explain, in the fullest possible manner, the exact nature of what I propose to do, and its consequences. It is gratifying to the operator, who has finally been driven to this expedient, to find gross lesions suitable for class demonstration, but the most typical relief often comes where the disease cannot be so easily demonstrated; and in cases where there are palpable tumors, the surrounding infiltration and cellutic inflammation are often serious enough to delay convalescence, for a long time defeating the operator.

Thus, if I were asked, in my own work, which of my cases had given the most gratification—that is, where had the relief been most typical and striking from a condition of suffering—I would point out a patient who was for more than two years unable to take a step on account of the great pain in the right ovarian region; in addition, she was a most wretched sufferer throughout the whole time. There were no gross lesions in the ovaries, and it was long a question with me whether she had not some other serious organic disease, which question I debated under the most varied and patient efforts at general and local treatment, until, with the removal of ovaries here shown, she rose up as if a great weight had been lifted off her and went home to Barnesville to her parents and friends, a walking miracle.

Another case, well illustrating this point, is that of Mrs. W., here shown. She suffered, as she only can describe to you, ever since her first menstruation, from pains which left her a most degraded picture of misery when she came to my office. I found the remains of chronic ovaritis and the wiry tubes of a chronic salpingitis and perisalpingitis, which had contracted down so tight and adhered to

so many surrounding structures that they were exposed and removed with the utmost difficulty. This patient has gained eighty pounds since the operation.

These results, and some others I might detail had I time, are undeniably brilliant; but cures are not always so typical, and I am often satisfied if I can but remove one element (perhaps the most distressing) of my patient's sufferings. If my patient can only come back to me and say, "you have taken away that dreadful pain in my back and stomach; life is now bearable, before it was unbearable," I am well content.

Mrs. B. (here shown) exhibits this well. She had a rapidly growing tumor in the right ovarian region, which seemed, in a most unaccountable manner, to prostrate her general health. I decided this to be a case of extrauterine pregnancy, and I believe my section proved it. She is now like another woman, although still under treatment for an induration of the left apex, undiscoverable before operation.

I do not, Mr. President, therefore, claim wonders for this field of work. I claim for it what is asked for other fields of our art—that the *results* justify the means. It is of *results* I wish now to speak, with a brief preliminary as to *difficulties*.

The difficulties encountered in handling small pelvic tumors are often very great, far exceeding those of removing an ordinary cystoma.

First, the abdominal walls, which have never been distended, press tightly down upon the contents, and the recti pinch the fingers like a vice, utterly defeating any effort to catch or raise pelvic viscera, and this in spite of ether and chloroform. I have been obliged twice to overstretch the recti before I could proceed.

Secondly, in case of chronic peritoneal inflammation, the bleeding from the more superficial vessels of the abdominal wall may be extreme.

Thirdly, the intestines, in this close sac, often cling to the fingers until they feel as if they were clothed with several pairs of gloves, and are just as useless.

Fourthly, when the patient is very obese, the embarrassment of the operator is greatly increased, requiring a much larger incision, prolonged manipulation, with difficulties of closure and subsequent dangers.

Fifthly, cellulitis, so common a concomitant, so draws down and anchors everything in the pelvis that the structures are elevated with extreme difficulty, and only a pedicle, in the *technical* sense, can be secured. The dangers of secondary hemorrhage from this kind of a tie is, I know, very vividly before the minds of all operators of experi-



ence. It is, at times, about like tying the apex of a broad-based pyramid. I tied off some broad ligament structures on a fibro-cystic tumor the other day which impressed me for all the world like putting a ligature on a papered wall.

Lastly, these smaller diseased structures often become parasitic on neighboring tissues and organs for their blood supply, and when they are torn loose, the bleeding is alarming; and it may be deep down in the pelvis, possibly requiring an enlargement of the original incision, and then only seen with the utmost difficulty of exposure and illumination.

With this introductory, I will read a table of cases operated upon by me in 1886. All the operations were performed within the seven months and a half during which I was at home, and almost all in my private hospital in Kensington. The condition of the patients is either settled or weekly improving, so that I feel at liberty to speak of *results*.

On but two cases of the list will I dwell any more in detail.

In one, James Dougherty, I did what has, I believe, never been done before: opened the abdomen upon a diagnosis of hypertrophic cirrhosis of the liver, with the intention of puncturing—hepato-phlebotomy.

The patient, about forty years of age, had a very large ascites, which had been treated for some weeks, but never tapped; and with full confidence in the safety of a simple incision, I made a free opening, large enough to admit two fingers, just below the umbilicus, thoroughly emptied the peritoneal cavity of two bucketfuls of fluid, and on reaching the liver found the organ contracted and hob-nailed; I consequently closed the incision, which healed perfectly. The fluid reaccumulated very slowly until the man died, some weeks after, in the natural course of the disease. My friends, Dr. R. P. Harris, and Drs. Freeman and Bradford, residents of the Episcopal Hospital, were present. I had long intended to use this direct method of abstracting blood from the liver, in view of my experiences in hospital and private practice since, before Dr. George Harley recommended plunging a trocar into the liver through skin, subcutaneous tissues, and two coats of peritoneum, in the right hypochondrium, with the same end in view—hepato-phlebotomy. If, however, I am going to draw blood from this organ in a state of inflammation, I prefer an incision free enough to allow me to handle the organ, and, under full control of the eye and touch, to direct the trocar to the proper place, free from the danger of wounding other

| No. | Name.   | Diagnosis.                                  | Operation.                          | Date.          | Result.    | Remarks.                                                                                                                                                                           |
|-----|---------|---------------------------------------------|-------------------------------------|----------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Mrs. B. | Cystic papilloma of broad ligament          | Incomplete removal.                 | Jan. 2, 1886.  | Died.      | Private hospital. Death in six days of peritonitis.                                                                                                                                |
| 2   | Mrs. D. | Menorrhagia.                                | Both ovaries and tubes removed.     | Jan. 31, 1886. | Recovered. | Private hospital. Worn to a skeleton by hemorrhages which had lasted for years two weeks at every menstrual period. Perityphilitis after operation. now in blooming health. Cured. |
| 3   | Mrs. C. | Ovarian tumor.                              | Removal.                            | Jan. 14, 1886. | Recovered. | Private hospital. Operation by Dr. C. B. Nancrede assisted by me. Fecal fistule six months after. Improved.                                                                        |
| 4   | Mrs. H. | Cystic ovary.                               | Removal.                            | Jan. 23, 1886. | Recovered. | Private hospital. Ovary large and full of extensive hemorrhages. Cured.                                                                                                            |
| 5   | Mrs. W. | Hæmatosalpinx.                              | Removal.                            | Feb. 17, 1886. | Died.      | Private hospital. Peritonitis.                                                                                                                                                     |
| 6   | Mrs. B. | Hydrosalpinx.                               | Removal.                            | Feb. 27, 1886. | Recovered. | Private hospital. Tubes large as sausages. Cured.                                                                                                                                  |
| 7   | Miss S. | Menstrual epilepsy.                         | Removal of tubes and ovaries.       | Feb. 24, 1886. | Recovered. | Private hospital. Remarkably improved after a temporary relapse. Condition yet doubtful.                                                                                           |
| 8   | Mrs. P. | Abscess of right ovary.                     | Removal by enucleation.             | Mar. 27, 1886. | Died.      | Private hospital. Found, post-mortem, large pus sac in pelvis.                                                                                                                     |
| 9   | Mrs. B. | 3 months tubal pregnancy.                   | Removal.                            | Mar. 20, 1886. | Recovered. | Private hospital. Pregnant. Later delivered of a large female child.                                                                                                               |
| 10  | Mrs. U. | Cellulitic adhesions of ovaries.            | Adhesions freed.                    | Mar. 13, 1886. | Recovered. | Private hospital. Now well.                                                                                                                                                        |
| 11  | Mrs. W. | Ovaritis, salpingitis, and perisalpingitis. | Removal tubes and ovaries.          | Mar. 17, 1886. | Recovered. | Private hospital. Well; has gained eighty pounds.                                                                                                                                  |
| 12  | Miss W. | Hydrosalpinx and stump of ovary.            | Removal.                            | Apr. 20, 1886. | Recovered. | Private hospital. No pelvic pains whatever, but frequent headache. Improved.                                                                                                       |
| 13  | Mrs. W. | Dermoid cyst.                               | Removal.                            | Apr. 25, 1886. | Recovered. | Private hospital. Patient operated on by Dr. T. R. Neilson, assisted by me.                                                                                                        |
| 14  | Mrs. G. | Ovaritis chronica.                          | Removal tubes and ovaries.          | Apr. 17, 1886. | Recovered. | Private hospital. Vastly improved.                                                                                                                                                 |
| 15  | Mrs. T. | Chronic cellulitis.                         | No attempt at removal.              | Apr. , 1886.   | Recovered. | Private hospital. Improved.                                                                                                                                                        |
| 16  | Miss S. | Pelvic abscess.                             | Stitched to abdominal wall.         | Mar. 21, 1886. | Recovered. | My home. Died in Pennsylvania hospital in summer.                                                                                                                                  |
| 17  | Mrs. W. | Pelvic cellulitic adhesions.                | Separated; no removal.              | Apr. 21, 1886. | Recovered. | Private hospital. Since bore child, and feels well.                                                                                                                                |
| 18  | Mrs. H. | Pyosalpinx and abscess of ovary.            | Enucleation of large fetid abscess. | May 5, 1886.   | Recovered. | Her own home. Cured.                                                                                                                                                               |
| 19  | Jas. D. | Cirrhotic liver.                            | Exploratory incision.               | Oct. 29, 1886. | Recovered. | His home. Improved from free tap. Died natural course of disease.                                                                                                                  |
| 20  | Mrs. G. | Pelvic abscess.                             | Abscesses opened into rectum.       | Oct. 4, 1886.  | Recovered. | Private hospital. Improved.                                                                                                                                                        |
| 21  | Mrs. M. | Tubercular peritonitis.                     | Opened; cleansed.                   | May 12, 1886.  | Recovered. | Private hospital. Recovery apparently perfect, with relapse in eight months, and again recovery.                                                                                   |
| 22  | Mrs. B. | Ovarian pregnancy.                          | Removal.                            | Nov. 4, 1886.  | Recovered. | Private hospital. Cured.                                                                                                                                                           |
| 23  | Mrs. B. | Hydrosalpinx; metrorrhagia.                 | Removal.                            | Dec. 17, 1886. | Recovered. | Private hospital. Cured.                                                                                                                                                           |
| 24  | Mrs. B. | Racemose ovarian cyst.                      | Removal.                            | Nov. 13, 1886. | Recovered. | Private hospital. Cured.                                                                                                                                                           |
| 25  | Mrs. T. | Chronic metritis and endometritis.          | Removal of appendages.              | Nov. 18, 1886. | Recovered. | Private hospital. Cured.                                                                                                                                                           |
| 26  | Mrs. P. | Papillomatous monocyst of ovary.            | Removal.                            | Nov. 18, 1886. | Recovered. | Private hospital. Cured.                                                                                                                                                           |
| 27  | Mrs. J. | Retroperitoneal sarcoma.                    | Exploratory.                        | Oct. 4, 1886.  | Recovered. | Her home. Now being tapped.                                                                                                                                                        |
| 28  | Mrs. S. | Papilloma of peritoneum.                    | Exploratory.                        | Dec. 21, 1886. | Recovered. | Private hospital. Temporary improvement.                                                                                                                                           |

structures or large vessels. The incision should be made just above the umbilicus.

Regarding the last case, that of my office nurse here, number twenty-one in the table, I will content myself by briefly remarking that she suffered constantly for four years with a dragging pain in the left side, and two years ago last December she was tapped for what was believed to be a large ovarian tumor. The fluid was straw-colored and coagulated spontaneously in the bucket. She came to me from Ogdensburg, N. Y., twenty months ago. There had been no reaccumulation of the fluid, but she suffered constantly with dragging pains in the left side. I found here masses attached to the left cornu uteri, which I mapped out in my book; but, to my astonishment, I found, in the course of a few weeks, while under treatment, that the tumor diminished and seemed to have shifted its site. Bimanual examination, while still revealing well-defined masses in the neighborhood of the uterus, yet yielded such a different find that I was disposed to distrust my records. As her suffering increased, I made an incision last spring, and found the intestines universally adherent, like one great sac, but free from the abdominal wall; the pelvic structures were so bound up that I could define nothing. Some serous fluid oozed up into the incision and coagulated *in situ*. This was carefully cleaned out of the whole peritoneum, a piece of membrane, containing isolated tubercular granulations, snipped off for microscopic examination, and the incision closed. She apparently made a perfect recovery, and returned to New York, doing a great deal of hard work all summer (had not been so well for twelve years). She returned to me upon my return from Europe, and, until seven weeks ago, remained in perfect health. The old pain then began to distress her again, and with it was a continuous elevation of temperature. After waiting until it was impossible for her to drag herself around any more, I again made an abdominal section, by a smaller incision to the right of the old incision, for the purpose of cleaning out the cavity and dusting well with iodoform. She insisted upon preparing everything for the operation herself, and lay down upon the table and submitted to the section *without a general anæsthetic*. I made multiple hypodermatic injections of a few drops of a four per cent. solution of cocaine in the line of the incision. The pain of the incision was but slight. It increased with the introduction of two fingers within the peritoneum, but was easily bearable. In fact, once she warned Dr. R. P. Harris, who was present, not to make her laugh. The only severe pain felt was in handling the matted structures in the left side of the pelvis. Sixty-



two grains of pure powdered iodoform were sprinkled over the peritoneal surfaces, the incision closed and the patient put to bed without the slightest shock or discomfort. She insisted on unbuttoning the jackets worn by the operator and assistant, and was as comfortable from that moment until she rose on the sixth day, to take a drive on the seventh day, as if there had been no operation. All trace of the induration has disappeared and she has since felt perfectly well, although the ultimate result remains very doubtful.

Eleven of the cases referred to in the above table were exhibited to the Society, and showed the scars of their incisions.

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## DISCUSSION.

DR. A. HEWSON said: I wish to express my opinion in reference to certain points in connection with the paper read. The speaker stated that he has resorted to the operation for the relief of pain in cases where the diagnosis was not definite and the existence of a tumor not positively made out. In an experience with over three hundred cases, I have not seen one in which relief of pain was not directly afforded by the application of clay.

In reference to the stretching of the cicatrix, it has been my lot to see a good many cases of hernia following laparotomy. In one three or four large herniæ protruded. In this case I resorted to the use of a fifty per cent. solution of silicate of soda applied on strips of gauze, such as the late Dr. Paul Beck Goddard used in his collodion dressings.

DR. J. M. BALDY said: I would first refer to the case in which the uterine appendages were removed for metritis. This is a new indication for the operation, and it seems to me that it would be a unique case in which such a procedure would be justifiable. There are many men of large experience who have not seen an uterus which they were unable to reduce to a normal size without recourse to surgical procedure. In regard to cystomata, it is important that as soon as they are diagnosed they should be removed. It has been claimed that rupture of the cyst is followed sooner or later by malignant disease not only of the appendages and peritoneum, but also of other organs. It is important in pyosalpinx that the appendages be removed on both sides.

I have seen a good many cases of pyosalpinx operated upon, and in some cases where the disease was unilateral the unaffected tube has been left. In a recent case operated on by Dr. J. Price this was done, and two months later the second tube became involved; on opening the abdomen it was found impossible to remove it on account of the adhesions present.

As a rule, we should beware of removing appendages in which, on examination, we can discover no disease. There are cases, however, which will tempt most of us to operate. Dr. Kelly's case of simple chronic salpingitis in which

he had such happy results is a case in point. A case operated on by myself was just such a one and terminated just as happily.

DR. J. PRICE said: In Dr. Kelly's cases it is as yet too early to speak positively with reference to hernia, but his incisions have been short. In the December number of the *Lancet*, Mr. Tait gives a review of this whole subject and of hæmatocele. I wish to argue against the removal of the appendages for defective involution. We have many other methods of treatment which will surely accomplish the same result without resorting to such bold measures. I consider this an unjustifiable procedure.

At present, the surgeon simply presents numbers and percentages of recoveries as representing the exact measure of his skill in operating and care in the after-treatment. Too great importance has been given to bare statistics. The conditions inherent in the patient which determine the result beyond the control of the surgeon are barely considered, nor faults of omission or commission on his part. Perfect evacuation of pus, the utmost cleanliness, and perfect drainage—I mean a high degree of surgical cleanliness.

The growing tendency to hold the surgeon strictly responsible for every unfavorable result has stimulated abdominal operators to great care, and the most careful study of every detail. Hence the methods of abdominal surgery have become well-nigh perfect.

DR. KELLY said: I have had no practical experience in the treatment advocated by Dr. Hewson; if it can be shown to be practicable in such cases as I have detailed this evening, I will try it. My efforts, however, have been directed toward the establishment of a cure, and not palliation. With reference to the case of enlarged painful uterus, with endometritis, of which Dr. Price has spoken, I desire most emphatically to make the following statement, and at once prevent any further misconception upon so serious a subject.

I hesitated in reporting this case lest I should be misunderstood. I do not wish to recommend a sectional operation for subinvolution or metritis in general. I am weekly treating many such cases without any idea of operative interference. In this particular instance the patient had not only been long under treatment in one of our first hospitals, but I had faithfully tried every means at my disposal for two years—counter-irritation, douches, packing, large wedge-shaped excision of the cervical lips, and an Emmet operation on the perineum, hoping by this support, free depletion, and rest in bed to secure a permanent advantage. She was only slightly benefited, remaining a miserable sufferer until I operated, removing tubes and ovaries. The uterus decreased *at once* in size, and is now three inches, with a small hard cervix, and reclines in the sacrum rocking-chair fashion. She has no local tenderness whatever. I attained here a perfect result which I was unable to reach in any other way, and under similar circumstances I should repeat the procedure. If permanent, this will be one of the most gratifying of my cures.

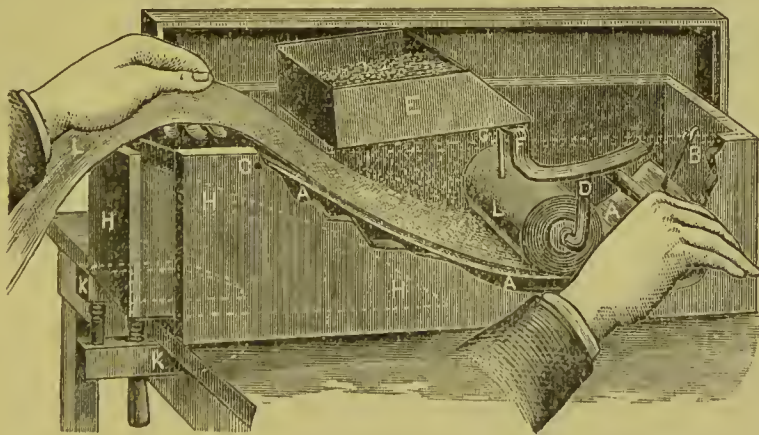
# A NEW APPARATUS FOR PREPARING DRY GYPSUM BANDAGES.

BY H. AUGUSTUS WILSON, M.D.

[Read February 9, 1887.]

ROLLING the dry plaster-of-Paris bandages by hand, the method usually in use, is unsatisfactory, and under the most favorable circumstances a dirty process. It was to avoid the inconveniences and irregularities of that method that I devised this apparatus, which I have had made by A. G. Gefvert, the orthopædic apparatus manufacturer.

It consists of an ordinary box-bandage roller, with the addition of the following: A movable bottom, A, A, A, held in contact with the outermost layer of the bandage, as it is rolled, by a rubber band B,



and at the other end by a hinge-joint C. Upon this movable bottom, and just in front of the crank, is a flood-gate or distributor, not shown in the illustration, which equalizes the distribution of the plaster and presses it into the bandage from above, while the movable bottom prevents the gypsum passing through the meshes. The proper tension is applied by two rubber bands.

A hopper, E, is provided with an arm, F, bent in such a manner as to be raised by the crank at each half turn, and upon being released



it falls, throwing down a quantity of the powder upon the bandage in front of the distributor. A compartment, H, H, H, occupying the otherwise waste space under the movable bottom, is utilized as a receptacle in which may be kept the gypsum when the apparatus is not in use.

A scoop accompanies the apparatus with which to take gypsum from the compartment and fill the hopper. The entire affair can be securely held to a table by a clamp, K. Elastic bands are used for springs, because they are inexpensive and can be very readily replaced when worn out.

The method of using is, first, to pass the end of the bandage to be rolled over the movable bottom, under the distributor, and attach to the crank. The hopper is now to be placed in position and, by means of the scoop, filled with a sufficient quantity of gypsum. While the crank is turned with the right hand the left guides the bandage, which may be watched, over the hopper, as it is being rolled.

The bent arm of the hopper is so arranged that the fall of the hopper may be sudden or gradual, and upon this depends the quantity of powder discharged. When the crank is turned very slowly the hopper is raised slowly and descends with the motion of the crank, and scarcely any gypsum is precipitated, and, of course, the converse follows. This being clearly understood, a very slight experience will enable any one to control the action of the hopper with the crank.

When a bandage is finished, the crank is withdrawn sufficiently to disengage it from the bent arm of the hopper, and while the left hand holds the bandage a quick reverse turn of the crank enables it to be easily withdrawn. The gypsum remaining on the movable bottom is now discharged into the compartment by placing the hopper to one side, detaching the spring, B, and raising that end.

The apparatus is applicable to the rolling of the ordinary surgical bandage by detaching the rubber spring, B, thus allowing the movable bottom to drop out of the way. It prepares the dry gypsum bandages evenly and quickly. It is very simple in its construction and action. It cannot get out of order, except by the breaking of the rubber bands. It is inexpensive.

Possessing these advantages, I hope it will be of service and facilitate the preparation of the dry gypsum bandages in the hands of other physicians as it undoubtedly has in mine.

## PERSISTENT PUPILLARY MEMBRANE.

By CHARLES S. TURNBULL, M.D.

[Exhibited February 23, 1887.]

I HAVE brought before you to-night a case of unusual interest to ophthalmologists and to medical men in general. The patient has in his right eye what is known as a "persistent pupillary membrane." This is a remnant of foetal life, but its exact structure has not been ascertained. Some consider it to be made up of atrophied bloodvessels, which have served their purpose. Other authorities hold that it consists of the remains of connective tissue through which bloodvessels pass. In this man's right eye there is a network of hair-like fibres occupying the outer half of the pupil. These fibres



originate from the anterior surface of the iris, and interfere in no way with the constrictor muscle of the pupil. This form of congenital anomaly was first observed about 1735, and on an average about one case has been reported every five years since that time. I am indebted to Dr. P. H. Bailhache, of the U. S. Marine Hospital Service, for the opportunity of exhibiting this patient.

## DISCUSSION.

DR. E. JACKSON said: This case is notable for the clearness with which it shows the relation between the membrane and the iris. In all the cases I have seen heretofore, as in this, the pupillary membrane has seemed to arise from the anterior surface of the iris; but in no other instance has the connection been so obvious, the membrane here appearing to be simply an extension of the anterior layer of the iris; and similar to it in structure.

DR. TURNBULL said that the point referred to by Dr. Jackson is well illustrated in this case, and it settles the disputed question as regards the origin of these fibres. It is distinctly seen that the sphincter muscle is in no way involved. The membrane has no connection with the muscle nor with the inner pupillary margin.



## SPECIALISM IN MEDICINE.

By ROSS R. BUNTING, M.D.

[Read March 9, 1887.]

THE object in presenting this paper before the Society this evening is not with the idea of offering anything new, but rather with the hope that in discussing this rather hackneyed subject, something of advantage to our profession may be suggested.

Specialism is a sign of progress. Herbert Spence, in his *Illustrations of Universal Progress*, says, "From the earliest traceable cosmical changes down to the latest results of civilization, we shall find that the transformation of the homogeneous into the heterogeneous is that in which Progress essentially consists." In the development of the human organism the same law is followed from uniform to multi-form, from simple to complex, from the general to the special, producing physiological division of labor or specialization of function. "It is always in the most advanced periods of civilization that division of labor is carried to its utmost limits. It is only the savage that combines in his own person in all their departments the character of philosopher, inventor, and operator." (*Political Economy*, Wayland.)

"Medicine was practised primitively by the chiefs of families, of tribes, and of nations, and by generals and legislators. Afterward it was joined to the sacerdotal office for a very long time. At last it constituted a distinct profession which was at a later period subdivided even into several departments." (Renouard's *History of Medicine*.) Medicine, surgery, and midwifery (the latter practised mostly by women, as it now is in some parts of Europe), appear to have been the earliest divisions. Some writers consider specialism to have existed long before the Christian era, but we think it is only within the last twenty-five years that real, true specialism may be said to have existed.

During this period there has arisen in our midst a practitioner known as the specialist. His advent was regarded with suspicion by the doctor. "He is like the locust plague of Egypt, devouring all be-

fore him ; he has mapped out all the organs of the body as his especial property, leaving nothing for us," exclaimed the general practitioner. A writer in the *Pacific Medical and Surgical Journal* has become so alarmed at some one signing himself "Neurologist," that ironically he says, "Why not have a pneumatologist to attend to the lungs, a ther-matologist to observe the temperature, a narcotizer to see that the patients sleep well, a defecator to attend to their bowels, and so forth?" He was considered a quack, and many instances were related of his want of principle in appropriating the patients of his brother physicians. Although such cases occur at the present day not only among specialists, but in the profession at large, we think there are very few whose sense of honor is no better than that of Artemus Ward, who says, "You ask me about my principles? I ain't got no principles, I'm in the show business." It is not surprising that the family physician was astonished and alarmed when he found the inroads this special practice made upon his daily living. But the specialist has come to stay, like the female physician, and no amount of professional opposition will drive him from our midst. Lord Bacon says, "Surely every medicine is an innovation, and he that will not apply new remedies must expect new evils." It were good, therefore, that men in their innovations would follow the example of time itself, which, "indeed, innovated greatly, but quietly, and by degrees scarce to be perceived." These innovations would certainly have been more agreeable, especially to the older physicians, had they come more gradually ; but they were necessary for two reasons : 1st. The public wanted them, and were not slow in finding out that in many cases they were cured or relieved sooner than by the family doctor. The author of *Lacon* shrewdly remarks, "It is better to have recourse to a quack, if he can cure us, although he cannot explain it, than to a physician, if he can explain one disease but cannot cure it." It is the fashion now to go to a specialist, for fashion reigns in medicine as in society. During the last twenty-five years how many methods of treatment have we seen, "that, like empires, have had their rise, culmination, and decay"? People with the most trifling ailments seek special advice, in many cases that could as well be attended by their family physician. Some time since we were called to attend a baby, about ten months old, for an attack of diarrhoea ; noticing a slight eruption on the face, the mother remarked "that the baby had been much worse, but having consulted a *skin doctor*, under *his* treatment it soon got better." If there be one class of cases which the family physician regards as his *especial* practice, it is that to which infantile

ailments belong. Having anxiously watched the advent of the little ones, often through sleepless nights, it is but fair he should attend them for the many diseases of babyhood.

2d. The accumulation of medical knowledge has become so great that one mind cannot master, much less employ, this knowledge in the practice of medicine. There are no "Admirable Crichtons" in our art. The genius of a Sydenham would shrink in despair before the immense masses of medical lore accumulated since his day. We read with astonishment of the acquirements of Dr. John Mason Good, who, to the reputation of a polyglot added that of one of the foremost practitioners of his age. It is universally acknowledged that the men of one idea, those who confine their attention to one thing, be it a business or a science, are the men who succeed, who represent the progress of the age, and whose names "posterity will not willingly let die." "There was once a boy put under the care of the Jesuits, who was noted for nothing but his stupidity. The teachers tried him abundantly, but could make nothing of him. At length one of the Fathers tried geometry, which so suited his genius that he became one of the first mathematicians of his age." We hear occasionally of physicians distinguished in the walks of literature, but it is extremely rare for them to be known to the public in this dual capacity—certainly posterity never remembers them as such. Oliver Wendell Holmes is but little known to the world as the professor of anatomy, but as the genial Autocrat of the Breakfast-table, and the author of that charming novel, *Elsie Venner*. We know but little of Dr. John Brown, of Edinburgh, as a physician, but as the essayist. If we could imagine a physician thrown into a Rip Van Winkle sleep of, say, but ten years, and then recommence the practice of medicine, he would be astonished at his own ignorance, so great would he find the progress in all branches of our art. He would feel "like the mouse which thought his chest was all the world, and was astonished when he stood upon the till and looked out to see what a great world lay beyond him." Having admitted the necessity of the specialist, we will now consider him in his relations to the medical profession. He ought to be regarded as the consultant of the general practitioner, and, when possible, to act and advise with him. An oculist once observed (with apparent satisfaction) that many people no longer consulted the family doctor about their eyes, but went at once to the oculist, as they would to a dentist for their teeth. With all due respect to the many honorable gentlemen in this line of practice, this is belittling the family physician, and the tendency will be to



throw the general profession into disrespect. Why should not a physician, who is worthy the name, be asked an opinion whether his patient should consult a specialist? Encourage the public to act in this manner, and the result will be to create an antagonism between the two classes of practitioners. Regarding the specialist as a consultant, would place the latter in the same position as the general consulting physician, who is supposed to comprehend and follow the Code of Medical Ethics. There has been a great change within the last few years in the attitude of the public toward the family doctor. Change of physicians seems to be the order of the day. Formerly they have been known to attend a family for two generations. Now many people change their doctor with every new illness. That specialism is partly responsible for this we have no doubt, but we think the desire for something new, and the want of faith in everything which characterizes our age, are also causes.

Duncan Gray, the village doctor, whose character is so beautifully portrayed in Scott's *Surgeon's Daughter*, belongs to a class of physicians which is fast disappearing, although to be regretted; this is but one of the old landmarks swept away by the flood of scientific progress. The limitations of specialism include the diseases which properly belong to it, and the number of specialists. The *majority* of diseases should be treated by the general practitioner. Take two instances from two different specialties. Why should not the average doctor be able to prescribe the proper glasses for simple hypermetropia, and apply the uterine dilator in cases where it is indicated? These methods of treatment are supposed to belong especially to the oculist and gynecologist. On the other hand, the busy practitioner would not have time (admitting that he has the knowledge) to attend to cases of mixed astigmatism, operations in laryngeal surgery, and the application of electricity, which necessitate the continued presence of the physician in his office, and require expensive instruments, for the outlay of which there would not be sufficient remuneration, so comparatively few would be his patients. We deem it obligatory on him, however, to have a working knowledge of the laryngoscope and the ophthalmoscope, which is just as necessary as an acquaintance with the microscope. Every year, as the physician becomes better educated, is his field of labor enlarged. Some years since, the application of the obstetrical forceps was regarded as an operation requiring a consultation; now every recent graduate considers himself capable of performing it. There are operations in general surgery, as lithotomy and ovariectomy, which will still be restricted to a few having special

skill and experience. The great dramatist's description of sorrows which "come not single spies but in battalions," we think would be applicable to the *number* of specialists.

Dr. Morell Mackenzie remarks, as one point of favor in specialism, that "in one city of the United States, of 130,000 inhabitants, he found thirteen specialists in throat diseases." We can well imagine the poor doctors in this city of many specialists, gazing around, and exclaiming with the bewildered Macbeth, "Can such things be and overcome us like a summer's cloud without our special wonder?"

To the ignorance of the general practitioner may be ascribed, in a great measure, the large number of specialists. With the increased facilities for study, extension of the curriculum in our medical colleges, and post-graduate courses, the young physician will enter upon the practice of his profession much better qualified than his predecessor of a quarter of a century ago. The simple cases he will always treat, and some of the more difficult ones. The general increase of medical knowledge will also operate favorably on the specialist, obliging him to possess a fair knowledge of general medicine, which is impossible for those "*who take up specialties*" without ever having had a general practice, a state of things much to be deplored, for, as has been ably remarked, "the body is an organism, *not* a mechanism, and he who has the widest knowledge of that body, its disorders and diseases, is best able to find out the matter with his patients." There will always be a field, an inexhaustible one, for special research, for from the latter must emanate most of our scientific progress. A wise author has truly said: "He that shortens the road to knowledge lengthens human life." And a well-known political economist furnishes another tribute to the usefulness of the specialist when he says: The advantage of the many is best consulted by each individual looking after his own good in the most intelligent manner. There should be no jealousy between the general and special practitioner, for both belong to that honored profession to one of whose members was applied by our Lord the title of "the beloved physician."

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## DISCUSSION.

DR. C. SEILER said: I feel that it is incumbent upon me, as a specialist, to say something about this admirable paper. The points are well taken. The author truly says that the specialist should be the helpmeet, the consultant, and the adviser of the general practitioner, and also that he should

advance scientific research and progress of medicine, by devoting himself exclusively to that branch which he has selected for his specialty. Of course, many of the so-called specialists are not so in the proper sense of the word. They are not exclusively engaged in the research and treatment of a certain class of cases, but simply pay particular attention to particular diseases.

Again, the specialists, as a rule, especially in the larger cities, are looked upon with disfavor by the general practitioner, simply because the general practitioner does not recognize the fact that it is impossible for him to take the time to diagnose and treat certain special cases, as, for instance, cases of refractive errors of the eye. It is not the province of the general practitioner to prescribe glasses, nor has he perhaps the manual dexterity to introduce the uterine dilator in cases where it is demanded, and perhaps he may not be competent to judge whether or not the uterine dilator is required. It frequently happens that the general practitioner, who uses the laryngoscope, sees certain cases and sends the patient to the specialist, giving a positive expression of opinion as to the cause of the trouble. I have in mind a case which I saw this afternoon, and which was referred to me by a physician who had diagnosed a tumor of the larynx and told the patient that the tumor could be easily removed, and that this would cure all his symptoms. The man, after travelling several hundred miles, came to my office. I found a tumor seated on the glossal surface of the epiglottis, not interfering with speaking or swallowing at all. He was also suffering from chronic laryngitis. When I explained the condition, the man was very much disappointed, as he expected to be cured at once. That is where the general practitioner makes a mistake. As I have already said, all the points in the paper are admirably taken, and I have nothing to say in the way of criticism.

DR. E. JACKSON said: The reader of the paper said that the large number of specialists might be ascribed to the ignorance of the general practitioner. I would state this differently, and call attention to a view of specialism which I think is not sufficiently considered. A young man who has spent a few months in some eye hospital, concludes to take up the specialty of diseases of the eye, and goes into some large town in the interior of the country, where specialism is unheard of. He is consulted by patients who have become blind from glaucoma, losing the precious time when relief was possible, by the advice of the best practitioners of the place, that they must await the ripening of cataracts that never existed. He will find other cases—for instance, of refractive errors—which have been improperly treated or not treated at all. Cases of this kind will give him reputation with the laity, but will probably make enemies in the profession, and raise some outcry against specialism. Now, in such a town, the fact is, *not that the general practitioners are ignorant, but that there are no general practitioners*. Those calling themselves general practitioners have been practising specialism in its commonest form—that is, the form in which the practitioner devotes his attention specially to acute inflammatory diseases, fevers, obstetries, and one or two other subjects, and ignores very many important branches of medicine. This is the form of specialism that has taken the firmest root and spread most widely; and specialism, so-called, is merely the necessary outgrowth of this, and is to a certain extent a recuperative reaction. This primary, widespread, and worst form of specialism arises from defective medical education. The



crowded college curriculum does not adequately provide for certain departments of medicine which are of as real importance as any, to the truly general practitioner.

DR. S. S. COHEN said: I agree in the main with all that Dr. Bunting and the other speakers have stated, but there is one point alluded to in the paper, on which I think the lecturer did not lay as much stress as he would have been justified in doing. There is no doubt that specialism is largely overdone. There was a time in the history of medicine when the necessity arose for that subdivision which is a token of progress. But the men who have made specialism what it is, of whose fame we are justly proud, were first trained as general practitioners. They did not go forth from the college doors with ophthalmoscope or laryngoscope to seek, to see, and to conquer. Too often is it the case to-day, that men without hardly having seen a case, and without being able to diagnose acute or chronic diseases affecting the whole organism, will let it be known that they are specialists devoted to this, that, or the other branch of medicine. These men are doing incalculable harm to their patients, to the profession, and to themselves.

Another point worthy of mention is this, that the specialists have enlarged the scope of our profession, and have done so for the general practitioner. All the facts which specialism has brought to light have been given to the profession to become common property. And it is our duty to have a general knowledge of all the advances, and to be able to use all the instruments of precision now used in diagnosis. There is not one of us who should not be able at least to make a diagnosis of the more common diseases of any and all regions of the body, so as to determine whether or not the treatment lies within the scope of his skill; or to know whether or not he must call upon special knowledge to confirm or assist the diagnosis, to advise or conduct treatment. And when, for any reason, the assistance of a specialist cannot be secured, we must not let our patients suffer needlessly, because of our own ignorance of that of which we have no right to be ignorant.

DR. J. H. PACKARD said: Having, unfortunately, arrived too late to hear anything of Dr. Bunting's paper but the last few sentences, it is perhaps presumptuous in me to offer any remarks; yet I will venture a word or two. I am entirely in accord with the last speaker in regard to the necessity of universality of education. I think this absolutely essential for the good of the profession; specialty of practice is, in cities at least, equally indispensable for the good of the public.

Many of the members present can recall the time when "specialism" was generally looked upon as an invention of the arch-enemy. A report upon it, in most condemnatory terms, was made to the American Medical Association. The idea was, I believe, that because many quacks advertised themselves as specialists, therefore all specialists were quacks, and all specialism was, or led to, quackery.

We are, of course, prevented from advertising ourselves as specialists; this would be in every way objectionable. The only legitimate advertisement we get is from our work. I think it was Syme who said, "The best way for a man to advertise himself is to cure his patients." Now a man is most likely to be successful in lines of practice which he has studied, and the increase of his business will be in the same direction. This is perfectly proper.

No one can object to a man devoting his attention to a particular class of cases. It is to the abuse of this that exception is taken by general practitioners. Thus, if a patient is sent or taken to a specialist for an opinion, by his physician, it sometimes happens that the latter is justly annoyed by finding the case taken quite out of his hands by the consultant. Or, again, a specialist in surgery has been in attendance upon a member of a family, when another member of it was attacked with typhoid fever; the specialist said he knew as much about the disease as any one else did, and assumed charge of this case also, to the exclusion of a physician who had long been regarded as the regular attendant of the family.

I think all trouble would be avoided, and the matter placed upon a satisfactory basis, by the recognition, on the part of specialists as well as general practitioners, of the great principle which underlies the Code of Ethics—the golden rule of doing to others as we would that they should do to us. The profession as well as the public would alike be gainers by such a state of things.

REMARKS AND DEMONSTRATIONS CONCERNING  
STICKING-PLASTERS, AS ILLUSTRATING THE  
IMPORTANCE OF ACCURATE ATTENTION  
TO THE MOST MINUTE DETAILS  
OF SURGICAL DRESSINGS.

BY ADDINELL HEWSON, A.M., M.D.

[Read March 9, 1887.]

I HAVE always, in my contemplations of work, as well as in its performance, followed the constant injunction of one of the best of teachers, and of the most devoted of fathers, namely, that of considering *fully* even the least of the details likely to arise in such work. If there are any gentlemen here to-night who remember that parent—he died in 1848, soon after this Society was organized—with his exquisitely delicate fingers and hands, which he always used with the greatest accuracy and refinement of motion, they need no explanations of the teachings by clinical examples as well as by the precepts which I then enjoyed. Many of the classes of the Jefferson College of those days—'46, '47, and '48—used to ask me toward the spring, when the evening twilight extended just beyond six o'clock, what I *then* seemed so quickly to find to do in my father's basement office on Walnut Street, for it was then evidently too dark to read there, and too light outside to justify my igniting the gas within. They would stop and watch for me, and I, immediately on getting in, would make some entries in a book—which I had first to place on the broad windowsill—of the weather observed in the afternoon previously by my father. Then, especially if the twilight was brief, I would begin exercises with my fingers in every direction, and particularly by motions with the thumb, index, and middle of either one, or both hands, simulating those of the needle operations for cataract of either side, and which were then most in vogue. Then came a match-box with its top and sides perforated with holes of various sizes, and containing pins and needles to correspond, by their heads



and points, with *those* holes, and which I had to pick up, without looking, by the right hand, and then by the left, and put them back in the holes to which they fitted best, either by points or heads.

So, when some one was playing on the piano in the parlor, after tea, when I had some little time to stay and listen, before going to the choicest of the lectures I was then attending—those on operative surgery, by Prof. Pancoast—and my father was there for the same purpose, he would come behind me, and, with the whisper in my ear, “Never be idle,” he would set my fingers going in some one of the many manners he had been long teaching me to be always exercising them.

With such schooling and discipline, begun and continued for so many years, it should not be surprising that I have for fully forty years been working at and thinking over all kinds of the most minute, and sometimes, apparently, the most trifling details of operations and dressings in surgery. That I have done so, is to be seen by the numbers and characters of many of the publications I have made since I began my professional studies.

At the time of the beginning of those studies there was a warm discussion going on as to the merits of, and what should constitute a good adhesive plaster. A professor of surgery, of high distinction, had often before declared that one might just as well attempt to improve the Bible as to undertake to improve the plaster he used. And yet many were doing so. There were then, in 1846, five or six large factories for making machine-spread plasters, in Philadelphia alone; the proprietors of which claimed, each for his individual make, merits which he as positively denied to that of others. Such greater excellences were chiefly in better ductility and flexibility, which were associated with durability, all of which were long afterward found to be due to the presence of different kinds of turpentine or resins in the formula used by those makers, or increase of the same kind. These were not long, by their doings, in showing that this addition of the quantity of turpentine was the occasion of the very frequent occurrence of erythema, erysipelas, and suppurative action in parts. And yet neither the users nor the makers of the desired kind of sticking-plasters attempted then to do without it, for in the subsequent revision of the formula of plasters in the *Pharmacopœia*, there were but four of the whole number (twenty-nine) that did not contain some such ingredient, and those very four were devoid of properties essential for the surgeon to have in his sticking-plaster.

Liston, who was then in the zenith of his glory—the boldest, most

dexterous, and most successful operator in London—abandoned altogether the use of the *Emplas. adhesivum*, or *resinæ*, and all others of the officinal articles, and resorted to the “English court plaster”—not, however, to get rid of the terebinthines, because the court plaster was then made “by applying to black silk by means of a brush, first a solution of isinglass, and afterward an alcoholic solution of benzoin” (Wood and Bache, *Dispensatory*, eighth edition, 1849, p. 463), for that plaster contained, as you see, a resin, but because the uses of all the officinal plasters had taught him that they were liable to provoke erysipelas in wounds. He did, however, at a later period, discover the source of such troubles in the presence of that very article of benzoin, for he abandoned the black plaster and employed one of whitish silk, covered on one surface by only a layer of refined isinglass—a clear Russian article which Dr. George B. Wood then said was the purest form of gelatine known.

About this time (1847) J. P. Maynard, of Boston, proposed for adhesive plaster the use of a solution of gun-cotton, made in ether and alcohol, called “collodion” then as now, but it failed utterly of success as it could not form its film over and across the edges of a wound and so hold them together. It also produced terrible distress when its contact was forced into the cut flesh. Soon after this proposition of Maynard, one of the greatest geniuses of our profession in Philadelphia, and who occupied the house adjoining my father’s—Dr. Paul Beck Goddard—called me into his office with the declaration that he had something good to show me, which was the using of Donna Maria gauze, a strong, wide-meshed, silk texture applied across the wound and secured there by painting the strips, cut warp-wise, with collodion through the meshes of the gauze on one side close up, but not in the edges of the wound, and when it got dry there, through those of the other side. By such care, and keeping the collodion for at least one-quarter of an inch away on either side of the cut edges of the flesh, it dried quickly and showed through its central portion that the edges were in perfect coaptation, a condition which could not be determined by the use of anything but a gauze texture. This demonstration by Dr. Goddard produced such a vivid impression of its advantages on me that I have ever since resorted to it as a means of support, also using various other kinds of open textures and other means than collodion to maintain them *in situ*. Thus, I have used different qualities of bolting cloths, crape lisse, and other silk tissues. Some as fine as four thousand meshes to each square inch, and

others as coarse as one thousand in the same space, determined by actual counting.

Of all such silk tissues I have found the bolting cloths, which vary in price from \$1.80 to \$4 per yard, forty inches wide, to be the most satisfactory, and they are to be had everywhere, for where there is a settlement in this wide country, there is always a flour mill where such textures are constantly on hand.

I have learned since Dr. Goddard's death that he had up to the close of his professional life used all such various textures.

The expensiveness of those silken tissues led me early to try others of cotton and thread, such as tulle, bobinet, tarlatan, mosquito-netting and the like, most of which had been dressed by manufacturers with starch to give them a better appearance, but which I have always had thoroughly washed out to secure their full flexibility and adjustability to irregular surfaces. Of them all so freed I have got the best results from the tarlatan, and it of a quality 20 warp by 20 woof to the square inch, is capable of bearing five pounds to such a square surface, when the traction is well diffused, a weight which is equivalent to that usually employed over the pulley at the foot of the bedstead in the treatment of adults for fracture of the thigh.

Goddard's projects after his first trials with the gauze and collodion were to get rid of some of the objections belonging to the collodion itself, as it was originally prepared. These were essentially its forming too brittle a film, and its liability to blister the epithelial surfaces, and, not unfrequently to excite erysipelas, all of them objections of a very serious character, but which he overcame by the addition of minute quantities of sweet oil or Chio turpentine—the former being preferable on account of its making the collodion less liable to blister or to develop erysipelas than the latter.

Following the inclination generated by the mode of my earliest studies I have been constantly searching for other (see paper read before the College of Physicians, October 4, 1882) adhesive materials such as glues, gclatines, and the like, made flexible by a small quantity of glycerine. Then a fifty per cent. solution of "liquid-glass"—that is, an aqueous solution of that strength of silicate of soda—and, still more recently, what was first named to me as "book-binders' paste." This last-named article in its pure and clean state is simply a wheaten flour paste made in a porcelain crock by boiling thoroughly one part of flour in three or four parts of cleanly filtered water, always for twenty minutes, stirring the mixture all that time by a clean, new, wooden or bone spatula, the former being preferable. Such



paste should be applied by a thin strip of wood, directly to the bare, clean integumentary surface of one of the sides which are to be secured together, and then one end of this strip of gauze is to be laid on it and rubbed gently and smoothly so that the paste will come through its meshes. It should be applied no nearer the edge of the wound than the collodion would be. It dries as quickly as the latter, and has, indeed, the advantage of always drying fast even on a moist, or dampened surface, a property wanting in the liquid-glass, as well as the glue, even where expedients have been previously used to dry the parts. When the end of the strip first applied is fixed by the paste, some of the latter is to be put on the other side of the wound, and the gauze strip drawn smoothly across it and pressed on that side; the surgeon watching the contact of the lips as to how well it is secured, rectifying any irregularity to be seen through the meshes by a probe. Sometimes in a long wound it may be advisable to secure the initial extremities of the gauze strips alternately on both sides. On other occasions it may be better to fix them on one side and draw all by their free extremities across, and so get equal amount of traction and tension in that way.

The paste when made strictly according to the directions I have given and kept covered in a dry place will not sour, and such paste can be made the vehicle of various kinds of antiseptics and disinfectants. The addition of a small quantity of corrosive sublimate (one grain to a pint), immediately after it is fully boiled, effectually prevents the germination and development of various kinds of microbes wherever it may be applied.

[NOTE.—Samples of the paste were shown, and its value illustrated by an application of it, and by magic lantern slides showing experiments performed to test its strength. A piece of gauze pasted to binder's board, by one square inch of surface, sustained a weight of from five to eight pounds. Two pieces of canton flannel pasted together over the same extent of surface, and subjected to a tension of eighteen pounds, did not separate, although the canton flannel was rent at another point.]

## ADMINISTRATION OF GASEOUS ENEMATA.

By J. SOLIS-COHEN, M.D.

[Read March 9, 1887.]

I DESIRED to exhibit Morel's apparatus for administering gaseous rectal injections, according to the method of Prof. Bergeon,<sup>1</sup> in diseases of the respiratory passages, and in blood-poisoning; but as it has not been forwarded from the Custom House, I exhibit a substitute made in imitation. The object in view is to supply to the venous circulation an antiseptic, such as sulphuretted hydrogen, in sufficient doses to be effective; a result impossible when supplied directly to the arterial current, a plan which would poison the patient. Sulphuretted hydrogen inhaled in far less than sufficient doses would suffocate the patient; taken by the stomach, it would produce other serious results. Administered by the bowels, however, and entering the venous current already deteriorated by organic refuse, it is quickly eliminated by the respiratory tract, which thus becomes subjected to its beneficial local antiseptic effects without subjecting the system at large to injury, as when thrown into the arterial current. In other words, the parasite is killed, without killing the individual.

Its beneficial effects in phthisis are explained by the action of the gas on the suppurative and septic surfaces, and not by any influence on the bacillus tuberculosis; the consumption proper, the exhaustion, being due to the suppuration and to the consequent septicæmia, and not immediately to the bacillus, which, while it produces the destruction of tissue, does not produce the morbid phenomena. The method of administration utilizes the discovery announced by Bernard in 1857, that toxic materials introduced into the economy through an organ at a distance from the arterial system could not penetrate into the arterial system because it is eliminated

<sup>1</sup> For details, see *Nouveau Traitement des affections des Voies respiratoires et des intoxications du sang par les injections rectales gazeuses, d'après la méthode du Dr. L. Bergeon.* Par V. Morel. Paris, 1886.

before that system can be reached. Volatile substances are eliminated by the pulmonary alveoli.

The antiseptic substance employed is preferably sulphuretted hydrogen. This is propelled by means of a current of carbonic acid. It is important that the carbonic acid be freshly made, and that the injection be made without any admixture of atmospheric air, the presence of which will cause griping.

The carbonic acid gas, as evolved from the action of dilute sulphuric acid upon sodium carbonate, is collected in a rubber bag previously emptied of air by rolling it. This bag is then connected with a hand-ball compressor, by means of which the gas is propelled through natural sulphurous water in a sort of Wolfe bottle, driving off the sulphurous gas with it through a tube, the terminal extremity of which has been passed into the rectum. Within less than a minute the escape of the gas by the lungs can be detected in the breath.

The beneficial results obtained in pulmonary phthisis by Dr. Bergeon, and reported last July to the Académie des Sciences, have been confirmed by Prof. Cornil, in a communication last October, to the Académie de Médecine, by numbers of French physicians, and by Dr. Hughes Bennett, of Mentone. Bergeon stated that the patients he considered practically cured, had no more expectoration, and only dry auscultatory signs of cicatrizing cavities, or other cicatricial results of old lesions. Some of them had become able to resume tolerably laborious employment, with full maintenance of the amelioration they had acquired.

In most patients, it is said, there is a marked diminution of cough, expectoration, and night sweats within two or three days. Nevertheless, the trifling expectorations of those apparently practically cured, continued to contain bacilli. This fact may be taken both for an indication that the immediate danger in phthisis is less from the bacilli than from the septicæmia which they set up, and as an indication that this protective treatment, when successful, should not be discontinued until the general healthiness of the tissues is sufficiently restored to resist the further development and sustenance of the bacillus tuberculosis.



## DISCUSSION.

DR. W. OSLER said: Recently, at the University Hospital, a patient very nearly expired after an injection of a mixture of carbon dioxide and sulphuretted hydrogen. I was not aware at the time that sulphuretted hydrogen, if given in sufficient quantities, is capable of producing poisonous effects even when taken by the rectum. I mention this accident, lest similar mistakes may arise. Evidently the amount of sulphuretted hydrogen which is given must be small. At the Biological Society, at Paris, some experiments were related, which showed that even a few cubic centimetres are sufficient to poison a good-sized dog. In the experiences which are related in French journals, the odor of sulphuretted hydrogen is readily observed in the breath, but I have not noticed this in any of the Blockley patients. This is an exceedingly interesting, not to say comical, method of treating phthisis, but it is too early to say what the results are likely to be. Certainly, however, in Dr. Bruen's hands, at the Philadelphia Hospital, they have been extremely good.

## THE SEASONAL RELATIONS OF CHOREA, RHEUMATISM, AND NEURALGIA.

By MORRIS J. LEWIS, M.D.

[Read March 23, 1887.]

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I HAVE been requested by your committee on meteorology and epidemics to read a paper on the influence of different conditions of weather on rheumatism and nervous affections, and take pleasure in doing so, but must state that the paper read by me before the Philadelphia Neurological Society, in October, 1886, which appeared in the *Medical News* of November 13, 1886, embodies nearly all the facts that I have to bring before you to-night. The salient points, however, I think I can bring forward in a clearer manner than then, having changed the method of tabulation so as to make the subject more easily comprehended. To my previous study I have, in this paper, added for the purpose of comparison the records of neuralgia about to be described.

A *daily* comparison between the state of the weather and disease could not be made, as the *days of onset* of the two affections, chorea and rheumatism, could not be obtained. The *months of onset* were, therefore, taken and compared with the *monthly* average of the weather; this, although rendering the result less accurate, will, however, show many points of interest, the study extending over the decade 1876-1885 inclusive.

The months of onset of 437 separate attacks of chorea were taken from the books of the Orthopædic Hospital and Infirmary for Nervous Diseases during this decade; and attention is drawn to the fact that it is the *time of onset* of the disease that is noted, and not the *time of application for treatment*; any conclusion drawn from the latter method of notation must necessarily be inaccurate. As it is a well-recognized fact that a relationship exists between chorea and rheumatism, which, it is needless to say, is as yet imperfectly understood, I thought it would

be of interest to compare with the cases of chorea the months of onset of attacks of acute inflammatory rheumatism, and for this purpose studied the notes taken at the Pennsylvania Hospital, which were placed at my disposal; from these were collected 467 separate attacks of acute rheumatism which occurred during the years in question, all cases being excluded that were at all doubtful, together with those that did not originate in this city: this, of necessity, excludes nearly all the cases occurring among sailors.

To compare neuralgia with these two affections, I have extracted from the article by Captain Catlin, on "The Relation of Pain to Weather" (read before the College of Physicians in June, 1883, by Dr. S. Weir Mitchell), the hours of pain per month for the period of his study of his own case from 1875 to 1882 inclusive; but, unfortunately, Captain Catlin was situated at West Point, and the years of study do not coincide; therefore, for a better comparison I have prepared a table in which the first year of the neuralgia record (viz., 1875) and the last three of my records of chorea and rheumatism (viz., 1883-84-85) have been expunged, this then includes a period of seven years, 1876-82 inclusive, in which the two studies coincide, except for locality.

The weather statistics were compiled from the records kept at the Signal Office in this city and consist of a study of the temperature, range of the thermometer, barometer, relative humidity, amount of rain and snow in inches, number of cloudy and rainy days, and the number of storm centres (centres of low barometer) passing within circles of varying radii drawn around Philadelphia as a centre.

The monthly average of the weather being thus studied for ten years was then taken and compared with the monthly average of disease; but the peculiarities about to be spoken of are best seen when a table is made which shows the mean of the ten years in question month by month.

It must be borne in mind that while the records of the weather are complete as far as they go, the cases of disease here reported are but a small portion of those that must have occurred in this city during that decade; the neuralgia record is an exception, as it is a complete record at least of the sufferings of one person. The 437 attacks of chorea are distributed among the twelve months of the year as follows:

|                    |                            |
|--------------------|----------------------------|
| January . . . . .  | 36 attacks = 8.2 per cent. |
| February . . . . . | 33 " = 7.5 "               |
| March . . . . .    | 67 " = 15.3 "              |
| April . . . . .    | 38 " = 8.6 "               |



|           |   |   |   |   |                             |
|-----------|---|---|---|---|-----------------------------|
| May       | . | . | . | . | 47 attacks = 10.7 per cent. |
| June      | . | . | . | . | 40 " = 9.1 "                |
| July      | . | . | . | . | 46 " = 10.5 "               |
| August    | . | . | . | . | 34 " = 7.7 "                |
| September | . | . | . | . | 27 " = 6.1 "                |
| October   | . | . | . | . | 18 " = 4.1 "                |
| November  | . | . | . | . | 19 " = 4.3 "                |
| December  | . | . | . | . | 32 " = 7.3 "                |

The 467 attacks of rheumatism are distributed as follows :

|           |   |   |   |   |                             |
|-----------|---|---|---|---|-----------------------------|
| January   | . | . | . | . | 50 attacks = 10.7 per cent. |
| February  | . | . | . | . | 44 " = 9.4 "                |
| March     | . | . | . | . | 45 " = 9.5 "                |
| April     | . | . | . | . | 81 " = 17.3 "               |
| May       | . | . | . | . | 48 " = 10.2 "               |
| June      | . | . | . | . | 32 " = 6.6 "                |
| July      | . | . | . | . | 28 " = 5.9 "                |
| August    | . | . | . | . | 26 " = 5.5 "                |
| September | . | . | . | . | 29 " = 6.2 "                |
| October   | . | . | . | . | 28 " = 5.9 "                |
| November  | . | . | . | . | 24 " = 5.1 "                |
| December  | . | . | . | . | 32 " = 6.6 "                |

To compare the relative frequency of neuralgia per month with these records, I have had recourse to the unique study of the relation of pain to weather by Captain Catlin, previously mentioned.

"The total amount of pain for the eight years ending January 1, 1883, was 12,994 hours, or nearly one-fifth of the time."

"The winter months hold the advantage as pain producers, and for this period, while the sun was north of the equator, there were 6783 hours, against 6161 hours while it was south of the equator."

The hours of pain were distributed among the twelve months as follows :

|           |   |   |   |   |                            |
|-----------|---|---|---|---|----------------------------|
| January   | . | . | . | . | 1220 hours = 9.4 per cent. |
| February  | . | . | . | . | 1084 " = 8.3 "             |
| March     | . | . | . | . | 1234 " = 9.4 "             |
| April     | . | . | . | . | 1062 " = 8.1 "             |
| May       | . | . | . | . | 1089 " = 8.3 "             |
| June      | . | . | . | . | 947 " = 7.2 "              |
| July      | . | . | . | . | 997 " = 7.6 "              |
| August    | . | . | . | . | 1060 " = 8.2 "             |
| September | . | . | . | . | 1006 " = 7.7 "             |
| October   | . | . | . | . | 1038 " = 7.9 "             |
| November  | . | . | . | . | 1104 " = 8.4 "             |
| December  | . | . | . | . | 1153 " = 8.8 "             |

In glancing over these figures, great variation in the number per month is seen; the two highest months for chorea being May and March respectively, and the two lowest October and November; while for rheumatism, the two highest are January and April, and the two lowest November and August.

The highest month for rheumatism follows the highest month for chorea, instead of preceding it, as we might have been led to suppose from our knowledge of the relationship between these two affections, although a considerable rise is seen in the number of attacks of rheumatism in January, two months before the greatest rise in the number of chorea cases.

The greatest suffering from neuralgia occurred in March, and the least in June.

An attempt to explain these variations, naturally brings us to a study of the varying conditions of the weather.

Nothing especial is seen in comparing with the chorea tracing (tabulated from the foregoing figures) that of the *mean relative humidity* (and by this is meant, not the *mean actual amount* of moisture contained in the air, but the *mean per cent.* of the moisture that could be held in suspension at the mean temperature of each month) or that of the mean barometer, except that there appears to be an increase in the number of attacks of chorea with a fall in these two tracings; the reason for this will appear later; neither is much learned by comparing the chorea tracing with that of the mean daily range of the thermometer, which shows the variableness of the different months; this is greatest in May, and least in December. The mean temperature tracing, which is highest in July and lowest in January, does not throw much light upon the subject. When, however, the tracings of the number of the cloudy days, and the days on which rain or snow fell, and the amount of rain, or melted snow in inches, are studied, a slight resemblance to the chorea tracing begins to be apparent, and the probable cause of this becomes more evident when the storm tracings are studied, because these meteorological factors may be considered as component parts of a storm. The cause of the relationship previously noted as existing between the chorea, and the mean relative humidity and mean barometer tracings, now becomes clearer, the storm centres being centres of low barometer.

In studying the storms, circles of varying radii were drawn around Philadelphia as a centre, and the number of storms, as marked on the weather bureau maps, counted in each.

The storms passing within the 400- and the 700-mile circles are the

only ones I will discuss; the former because this tracing shows the nearest resemblance to that of chorea, and the latter, because the average distance over which a storm can influence neuralgia has been found by Captain Catlin to be about 700 miles. A very strong resemblance exists between these two storm tracings.

The smallest number of storms passing within the 400-mile circle occurs in August; a rapid rise of the tracing then takes place, until December and January are reached, then there is a slight fall in February, immediately followed by a rise to the highest point in March, after which there is an irregular fall until the low point in August is reached. The total number of storms passing within this circle for the ten years in question, is 520, and they are distributed as follows:

|                     |                            |
|---------------------|----------------------------|
| January . . . . .   | 60 storms = 11.5 per cent. |
| February . . . . .  | 54 " = 10.3 "              |
| March . . . . .     | 75 " = 14.0 "              |
| April . . . . .     | 46 " = 8.8 "               |
| May . . . . .       | 41 " = 7.8 "               |
| June . . . . .      | 28 " = 5.3 "               |
| July . . . . .      | 34 " = 6.5 "               |
| August . . . . .    | 19 " = 3.6 "               |
| September . . . . . | 24 " = 4.6 "               |
| October . . . . .   | 32 " = 6.1 "               |
| November . . . . .  | 47 " = 9.0 "               |
| December . . . . .  | 60 " = 11.5 "              |

Any one comparing a tracing made from these figures with that of chorea, must be struck by the resemblance between the two, which is more than accidental.

While the chorea tracing shows a strong tendency to keep pace, month by month, with the irregularities of the storm tracing, that of rheumatism, while also strongly resembling the latter in its general characteristics, may be seen to be almost exactly *one month later*, looking as if the effect of the meteorological changes was immediate in the case of chorea (as will be seen later to be the case with neuralgia), and preparatory only in the case of rheumatism. A marked resemblance exists between a tracing made from the hours of pain per month previously mentioned, and the storm tracings, even when the years of study do not coincide; when, however, a table is prepared for the years 1876-82 inclusive, during which the studies do coincide, the great resemblance becomes manifest; this is most marked with the 700-mile, and less marked with the 400-mile tracing, although still pronounced.



For the purpose of this study the division of the year into months is unfortunate, as the number of days in each is not alike. For the ten years 1876-85 this makes a difference of 27 days between January and February, but this will not account for the great variation in the number of attacks or storms per month, although it exaggerates the tracings in some instances.

It would be interesting to know how many nervous affections are thus immediately influenced by the weather, and in how many others are the meteorological changes to be looked upon as preparatory to the outbreak of the disorder.

The hot weather of July has been shown to precede the month of onset of the greatest number of attacks of infantile palsy.

A similar study in the case of epilepsy, hemiplegia, and many other affections might open up much that is new.

TABLE SHOWING THE FIGURES FOR CHOREA, RHEUMATISM, NEURALGIA, AND THE 400- AND 700-MILE STORM TRACINGS FOR THE YEARS 1876-82 INCLUSIVE.

| MONTH.              | Number of attacks of chorea. | Number of attacks of rheumatism. | Hours of pain. | Storms passing within 400-mile circle. | Storms passing within 700-mile circle. |
|---------------------|------------------------------|----------------------------------|----------------|----------------------------------------|----------------------------------------|
| January . . . . .   | 22                           | 33                               | 1018           | 44                                     | 76                                     |
| February . . . . .  | 16                           | 27                               | 918            | 38                                     | 67                                     |
| March . . . . .     | 50                           | 34                               | 1045           | 55                                     | 76                                     |
| April . . . . .     | 24                           | 54                               | 932            | 33                                     | 58                                     |
| May . . . . .       | 27                           | 35                               | 907            | 25                                     | 46                                     |
| June . . . . .      | 28                           | 18                               | 827            | 21                                     | 42                                     |
| July . . . . .      | 30                           | 13                               | 875            | 25                                     | 38                                     |
| August . . . . .    | 21                           | 16                               | 885            | 15                                     | 41                                     |
| September . . . . . | 16                           | 18                               | 901            | 19                                     | 43                                     |
| October . . . . .   | 14                           | 16                               | 903            | 21                                     | 49                                     |
| November . . . . .  | 10                           | 15                               | 914            | 32                                     | 43                                     |
| December . . . . .  | 17                           | 17                               | 977            | 47                                     | 71                                     |
| Totals . . . . .    | 275                          | 296                              | 11,102         | 375                                    | 650                                    |

## DISCUSSION.

DR. W. OSLER said: This is a very important and valuable (as well as seasonable) contribution to the interesting and obscure question of the relations of chorea and rheumatism. As Dr. Lewis has remarked, it is not a little curious that, in his tables, rheumatism has followed chorea, while the common experience is that chorea follows rheumatism. It is the more usual sequence for a child who already has rheumatism to develop chorea, though they frequently come on so closely that it is sometimes difficult to say which came first.

I would ask Dr. Lewis whether or not his statistics in this matter give any clew as to the relationship of these two diseases? In what way chorea is related to rheumatism, or in what way the rheumatism to the chorea? The recent statistics of the Committee of the Collective Investigation of Disease in Great Britain, show that some thirty-two per cent. of all the cases of chorea (430 in number) were associated with rheumatism. These affections have, in common, extreme liability of endocardial complications. It is not improbable that all cases of chorea have endocarditis. So far as the morbid anatomy goes, I do not know of an instance in which the mitral valve did not present vegetations. In the three instances that I have examined, this has been the case. In the cases occurring at Guy's Hospital over a number of years the same has been true. So far as my reading goes, the experience of German observers confirms this view. It might be interesting to ask whether the blustering, stormy weather of the past two months has brought out an unusual number of cases of chorea. It has not brought them to my clinics.

DR. W. B. ATKINSON said: I have had within the last four weeks, at my clinic, three severe cases of chorea. During the month of January I did not see a single case. I cannot say that I have ever seen a case in which an attack of chorea antedated rheumatism, but I have seen many cases in which rheumatism has been followed by chorea.

DR. LEWIS said: I am unable to explain the relation between chorea and rheumatism. With reference to the statistics, I will state that those of chorea were obtained from the Orthopædic Hospital, the patients, as a rule, being children, while those of rheumatism were from the Pennsylvania Hospital, and the patients mainly adults.

Dr. Osler mentions that he has not seen an increased number of cases of chorea at recent clinics. I think that he will find that many cases that have occurred will arrive or be heard from later. It is not the month of application that I have taken, but the month of onset.

# SYMPATHETIC OPHTHALMITIS, WITH KERATITIS; RECOVERY, AFTER EXCISION OF THE EXCITING EYE.

By EDWARD JACKSON, M.D.

[Read April 27, 1887.]

SYMPATHETIC ophthalmia, like smallpox, is now more rare than formerly, because we have for it a reliable prophylactic. That cases still occur is due to the fact that prophylaxis is sometimes neglected; and the continued diminution of their number depends, as with smallpox, upon keeping alive a just appreciation of the serious character of the disease, and the necessity for prophylactic measures. Though this is sufficient, there are additional reasons for recording the following case:

George M., aged thirty-nine, a carpenter, came to me for inflammation of the left eye, which had commenced two weeks earlier, the eye having before that been perfectly well. It presented a moderate conjunctivitis, the cornea was slightly hazy throughout, and there was a superficial ulcer near its lower margin and another near the upper outer border. There was a marked pericorneal zone, broadest opposite the ulcers. The iris seemed normal, the pupil was 5 mm. in diameter, circular, and immovable (he had been using atropia by the advice of Dr. P. C. Hoskins, of West Chester, with whom I continued to see the case), and subsequent trials showed that 5 mm. was the widest dilatation of his pupil that atropia or similar mydriatics would produce. The media back of the cornea were normal. The optic disk was *very decidedly* reddened, but not swollen or indistinct of outline; the fundus otherwise normal. The patient and Dr. Hoskins agreed that the eye looked decidedly better than it had a few days before.

The right eye presented an adherent leucoma near the outer margin of the cornea, which was otherwise clear. The pupil was distorted and closed by a dense white membrane, which, toward the inner side, fell back a little from the margin of the iris, indicating that the lens was absent from its normal position. The tension of the globe was below the normal. Good central light perception, but with the field narrowed in all directions, especially upward. The history of this eye was that, six years before, it had been struck by a fragment of steel flying from the edge of a cold chisel. This was followed by severe inflammation, which subsided in a few weeks, and *the eye*



*had never been at all sore since.* It was now free from undue tenderness or other symptom of inflammation. The treatment ordered was applications of a 1 to 120 solution of silver nitrate to the palpebral conjunctiva, and continuance of the atropia, with dark glasses.

Two days later the eye became decidedly worse. He was confined to a dark room, atropia solution 1 to 60 was instilled every two hours, a saline cathartic was given, and he was put on the use of mercuric chloride and potassium iodide. I saw him at the end of a week. There was now general hyperæmia of the eyeball. The mass of the cornea was clearer, but there was slight keratitis punctata and distinct vitreous opacities; vision,  $\frac{12}{60}$ ; great

pain and photophobia. I enucleated the right eye, finding it free from evidences of recent inflammation, but presenting in the ciliary region, below, a mass of lymph the size of a split pea, in which was embedded a splinter of steel 3 mm. long, and weighing between two and three grains. The socket healed normally. At the close of the operation, and still five hours later, the left eye was decidedly paler than before the right was excised. The only change in treatment was the application of a blister to the left temple, and the use of a drop of a four per cent. solution of cocaine with each instillation of the atropia solution. Next day the eye was worse, but after that it improved.

One week after the excision the general hyperæmia and the photophobia had greatly decreased, but the lower corneal ulcer was much deeper, with a gray base. The application of cocaine and the internal use of mercuric chloride and potassium iodide were discontinued. At the end of the second week the eye had improved in every way. Then it grew worse. The hyperæmia and photophobia increased greatly, and very severe pain recurred every afternoon. Leeches applied to the upper lid gave no relief. When I saw him again, on the twenty-first day, the corneal ulcer was deeper than ever with an infiltrated base, the pupil was contracted, and the surface of the iris exhibited plastic exudation, vision reduced to counting fingers at twelve feet, and his appetite impaired and circulation feeble. He was placed on small doses of mercuric chloride, with tincture of the chloride of iron and quinine; and locally the instillations of atropia were again increased in frequency to once every two hours, hot stupes were applied twice daily, and the conjunctiva was washed out every hour with a solution of mercuric chloride 1 to 5000. Improvement was immediate, and from this time steadily progressive. Two weeks later the corneal ulcer was nearly filled with cicatricial tissue, the remainder of the cornea clear, iris normal, pupil fully dilated and circular; the vitreous almost clear, and fundus apparently normal. At the end of six weeks, vision with the correcting glass was  $\frac{20}{XXV}$  partly. At eight weeks after enucleation, vision =  $\frac{20}{XX}$  full, with + 0.75 spherical lens; and, except the corneal opacity, and a couple of specks on the anterior lens capsule, the eye seemed normal in every respect. Five months later it continued so; and recently, thirteen months after the enucleation, I was told he was working at his trade, and that his eye continued well.

In discussing this case, the first question that arises is, Was this ophthalmitis due to the injury of the other eye, which for six years

had given no evidence of active disease? Arlt says: "In order to establish the sympathetic nature of an affection, there should be a continuous, or at least a temporary, increase in the inflammatory or irritative condition of the uveal tract of the eye first attacked." Again, "According to all experience, it never happens that foreign bodies, after having been long encysted, or an exudation long since ossified, cause a sympathetic affection of the other eye without symptoms of inflammation or irritation in the eye first attacked."

And recently, M. Dianoux, in opening a discussion of the subject before the Société Française d'Ophthalmologie, makes a similar rejection of cases like this by his definition of the disease. But this is simply begging the question. In this case there were neither history, symptoms, nor collateral evidence to indicate syphilis or rheumatism. It presented hyperæmia of the disk, serous iritis, keratitis punctata, vitreous opacities, plastic iritis, and repeated relapses. What other symptom save the one under discussion could have helped to make the diagnosis more certain? Nor is this case entirely exceptional. Among the 211 cases collated in the report on sympathetic ophthalmitis made by its committee to the Ophthalmological Society of the United Kingdom, in March of last year, 23 cases of this kind are included. Ten of these may be disregarded, because the supposed sympathetic disease assumed an unusual form, or ran an unusual course; but the remainder are not open to this kind of criticism. In one the interval was eighteen years, in another fourteen, in another ten, and in another eight. In all of these, however, the patient does not seem to have come under observation until many months after the onset of the sympathetic disease; except the last, which was seen some five or six weeks from its beginning. A case, however, coming on four years after the cessation of symptoms in the injured eye, was seen by Nettleship, both at the time of the original injury, and within five days of the first indication of sympathetic disease. The other cases mostly occurred within two years of the subsidence of inflammatory symptoms. Not only did this committee find that cases of this kind occur, but they also say: "Though the series is small, we may safely conclude from it that sympathetic ophthalmitis occurring after a long interval, and without any fresh inflammation of the exciter, is by no means likely to be mild."

It may well be questioned if the corneal ulcer and conjunctivitis had any necessary connection with the sympathetic disease. Yet I find that in three of the cases which form the basis of the report mentioned, corneal ulcer was noted, and, in one, conjunctivitis. And at

the meeting of the American Ophthalmological Society, in 1880, Dr. D. Webster reported as sympathetic a case of catarrhal conjunctivitis which had occurred in the service of Dr. C. R. Agnew, and stated that Dr. H. D. Noyes had "presented a case of sympathetic conjunctivitis to the New York Ophthalmological Society."

The above points bear upon the diagnosis of sympathetic ophthalmitis. Of equal importance are certain questions of treatment. Atropia, I think, saved this eye from the baneful effects of posterior synechiæ. The use of tonics was symptomatic. Mercury was given internally on the strength of tradition; but it may be noted that improvement occurred under its use, and that the relapse, running into plastic iritis, happened some days after its administration had been suspended. Its local use caused no notable irritation, and was followed by rapid healing of the corneal ulcer. But the most important point in regard to treatment is the question of removal of the exciting eye. Here removal was followed by recovery. In other cases recovery has occurred without removal. Or, again, as in a case reported here some years ago, by Dr. A. D. Hall, removal has been followed by very great permanent damage or complete loss. Referring again to the report above quoted, we find that of its cases the exciter was removed early in 64, of which 8 were lost; and it was removed very late or not at all in 65, of which 26 were lost. From their investigations that committee draws the very moderate conclusion, "that whether early removal of the exciting eye be positively useful in staying the disease or no, it is certainly not injurious, as no less an authority than Mauthner has asserted that it is when the sympathetic disease is of the 'serous' form."



## EAR-TRUMPETS.

BY CHARLES H. BURNETT, M.D.

[Read April 27, 1887.]

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THERE are three reasons why the deaf should use ear-trumpets :

1. In order to aid the hearing.
2. To improve the hearing.
3. For the convenience and comfort of those conversing with the very deaf.

1. When a person becomes very deaf in both ears, some resort to an artificial aid of hearing must be made. So long as one ear remains fairly good, patients will not use an ear-trumpet for the deaf ear. But when ordinary tones near the ears are heard either very imperfectly, or not at all, the sufferer gladly resorts to some form of ear-trumpet.

Most of these are unpleasant and imperfect aids, from their disagreeable resonance, and poor conducting powers. They also bruise the meatus, in most cases being made with an ear-piece which fits into the mouth of the auditory canal. These discomforts and imperfections, in the average ear-trumpet of all forms heretofore invented, added to the natural indisposition to employ an ear-trumpet because of its conspicuousness, have in most cases led to an early abandonment, or a partial use at least, of such an instrument.

The cause of ordinary deafness is, in most cases, a catarrhal thickening of the mucous membrane over the ossicles and the inner surface of the membrana tympani, leading to more or less ankylosis in these parts. Passive motion overcomes in them, to a greater or less extent, the immobility induced by this sclerotic process, as it does elsewhere in the osseous and muscular systems. The form of passive motion which acts most naturally on the ossicula auditus and their joints, is sound.

If, therefore, sound-waves are concentrated in more than usual quantity or vigor upon the stiffened membrana and the ossicles, as by means of an ear-trumpet, hearing is induced, if the auditory nerve is

unimpaired. If the latter is impaired, no form of ear-trumpet will be of use.

2. Not only does such a form of passive motion give immediate relief to the deafness in most cases, but such a form of passive motion, acting frequently and systematically upon the ear, prevents further ankylosis in the conductors, and fatty degeneration of the auditory nerve from desuetude. This, of course, tends to a permanent improvement of the hearing, and, in some instances, patients come to hear at last without a trumpet.

If such a force were brought to bear early in cases of deafness from ankylosis in the ossicula, the defects in hearing could, in most cases, be arrested, and, to some extent, removed. This form of aid to hearing has its happiest results in very deaf children, in whom the loss of hearing often entails loss of speech, if they have already learned it. If they have not learned to talk, and their deafness depends on catarrhal disease in the middle ear, and not on a lesion of the acoustic nerve, the use of a good ear-trumpet will rescue them from entire deaf-dumbness.

3. The convenience and comfort of those who communicate with the deaf by means of a trumpet are not the prime, though important considerations. For, if this mode of conversation is rendered difficult by reason of the imperfect ear-trumpet at command, it will not be readily or willingly employed, and, in the case of children, therefore, not enough will be said to them to improve their hearing or to teach them speech.

The most useful ear-trumpets yet presented to my notice are those of Mr. Maloney, who exhibits them here to-night. They are not only useful as conductors of sound, succeeding where other forms fail, but they do not fit into the meatus. They are held to the ear, the aural end of the instrument being supplied with a disk, and not a tip for the meatus. This does away with bruising the canal, or exciting furuncles in it, so common in the employment of the forms heretofore in use.

They have been devised in a scientific manner, and introduced to the profession on their own merit. The best results, or the most signal ones, have been obtained by the so-called silent instrument. This is simply because it is the most powerful, and hence renders most aid to the very deaf, the only people who are really willing to use any instrument. The smaller instruments are just as good for those not very deaf, and, if used by such patients, would aid in the retention of hearing, and tend to cure their hardness of hearing, as I have shown.

But the less afflicted class seem unwilling to use any form of ear-trumpet. All ear-trumpets of any value must possess some size in order to contain a column of air sufficient to impress the drum. They must be larger than the auricle with which the patient is already supplied. Hence, all invisible appliances, so called, are self-evidently good for nothing.

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## DISCUSSION.

MR. J. A. MALONEY, of Washington, was introduced, and said:

Mr. Chairman and Gentlemen: I have been requested to lay before you this evening the results of my investigations in "Aural Mechanics," together with the instrumentalities employed by me for the relief and training of the deaf.

My attention was called to this field some years since, while conversing with a deaf friend; after leaving him, this query presented itself to my mind: Why is it that no one stands in the same relation to the deaf as the optician does to those with defective sight? I concluded that the field was a very wide one. I took up first the study of the anatomy and physiology of the ear. I then commenced my labors in "Aural Mechanics," with a mode of procedure as follows:

1st. To develop instruments as far as I could to meet the various phases of defective audition.

2d. To construct the instruments to give satisfactory results without entering the auditory canal.

3d. To use artificial drums or membranes to guard against impact of air upon the "membrana tympani," and prevent reverberation, so common in all the old forms of instruments. I decided that a scientific instrument should possess these three essential qualities: it should be large enough to be of practical value; it should augment sounds: but with such augmentation the "timbre" or quality of sound should be preserved.

We are all aware that the *membrana tympani*, unlike other stretched membranes, responds to all vibratory motions within a certain limit, whether they are in the form of noise or of composite tones, transmitting through the intermediate agencies of the middle and inner ear, to the nerve of hearing auditory sensations.

Could a stretched membrane be arranged, so closely imitating in function the one given to man, as to show how beautiful are the harmonies of nature?

After experimenting twelve months, I adopted the form of membrane which I will present to your notice. The reason for its adoption came about in this way. In the early stage of my experiments I invariably found a lack of clearness of tone, until one day the thought occurred to me that I could secure uniformity of tension by clamping the membrane between two rings. When this was done, I found it a great improvement over all other methods, and consequently adopted it after thorough tests.

Even after obtaining good results, I could not but feel that there must be some other result produced by the rings than that of maintaining a uniform tension of the membrane. I found that while the membrane was upon the



stretcher-frame, with the rings glued upon each side of the membrane, like any other membrane, it would be thrown into sympathetic vibrations by tones corresponding to its fundamental; *but that when cut from the frame*, and dependent for its tension upon the two rings alone, it would not respond to a tone corresponding to its fundamental. Now it has been thought that the last named feature exhibited by the membrana tympani was produced by its union with the auditory ossicles. But may it not be due to two facts?

1st. That the margin is thickened.

2d. That the middle layer, or "substantia propria," is fixed to a ring of bone.

You will observe that my membrane describes a central vertical line between the two rings acting as clamps, and that the rings themselves represent the ring of bone to which the middle layer, or "substantia propria," of the membrana tympani is attached.

In the construction of the instrument, the fact must be borne in mind that it must be arranged to suit and compensate for the defect of hearing.

1st. Arrange for high tones, if the defect is in that direction; or for low tones, if the defect is in that direction.

2d. The augmentation and clearness must be to the extent that the person will hear every word spoken, instead of a word here and there, as heretofore, which involves a severe mental strain to construct the incomplete sentences.

[The following forms of instrument were then exhibited and described:

No. 1, for low and medium sounds.

No. 2, for high sounds.

These cover ordinary, and some special cases.

No. 3, "Silent," used in training and in some cases constantly.

No. 4, a modification of No. 1, to be kept in position by its bearings on the concha, tragus, and antitragus.]

DR. S. S. COHEN said: I had the pleasure of seeing some time ago a demonstration of these instruments in the case of some patients of Dr. J. Solis Cohen, and they acted very satisfactorily. A letter was received some time ago from Dr. Lacharriere, of Paris, the eminent physician in charge of the National Institution for Deaf-mutes, inquiring as to the truth of reports that in certain institutions in this country, especially in New York, eartrumpets were being used in the instruction of so-called deaf-mutes and that it had been found that a gratifying proportion of children thought to be totally deaf, reacquired in this way a certain degree of hearing power. After some correspondence we learned that Mr. Currier, Professor of Articulation in the Deaf-mute Institution at Washington Heights, New York, had used an instrument different in construction from that of Mr. Maloney, with good results. I have here two contributions which he has published, in the *Annals of the Deaf and Dumb* for January and for October, 1885. He reports a number of cases that have acquired the power to carry on conversation. Mr. Currier uses what is termed the "conical conversation tube," attaching two mouthpieces and tubes to a single earpiece, in order that the patient may hear his own voice as well as that of the instructor. His system of instruction to reawaken so-called "latent hearing" is ingenious, and from his reported cases, apparently quite successful. If Mr. Maloney's earpiece were attached to Mr. Currier's double tube, it might be found still better.

DR. C. WIRGMANN asked, Is there any liability for the rubber disk to get out of order?

MR. MALONEY said: With reference to the durability of the rubber, I would say that it has a protective coating. During the past nine months I have exposed them to varying changes of temperature without any apparent effect. If the membrane should get out of order it can easily be replaced.

I have never had my attention called to the instrument of Mr. Currier until the matter was mentioned by Dr. Cohen this evening. I find that his instrument is open at both ends. In speaking of what I term No. 3, or "silent," instrument I neglected to state that it is closed at the end nearest the ear. The object of this is to prevent the impact of the air on the drum of the ear. Such impact has a tendency to destroy the clearness of the tone. With my instrument the only impact on the "membrana tympani" is that of the column of air in the auditory canal between the membrane of the instrument and the drum of the ear, thereby developing *true auditory sensations*, which cannot be produced by instruments open at both ends.

While I have done something in the way of testing those supposed to be entirely deaf, I am not prepared, without my notes, to speak on this subject, because I have not yet finished the line of tests marked out. I can say, however, that I have made tests in two cases supposed to be totally deaf and dumb. One was a man, forty-two years of age, and deaf from childhood. I made him hear on both sides *noise only*, for the percipient functions had never (as in such cases) been trained or educated.

The other was a boy, eleven years of age, supposed to hear very slightly on one side only. Upon making tests I found he could hear on both sides, *noise only*, for the same reason as mentioned in the foregoing case.

When I complete the line of tests marked out I shall be glad to present the results to this Society, if it is their pleasure to hear them. I thank you, Mr. President and gentlemen, for your invitation and attention, and for the honor you have conferred upon me.

DR. C. H. BURNETT said: The question of so-called latent hearing in deaf-mutes is, of course, very important. In one sense, there is no such thing as latent hearing. Without doubt, many deaf children lose the power of talking if they have previously acquired it, or fail to learn to speak on account of their inability to hear. In the case of a graduate of two deaf-mute colleges, the man's wife discovered that he could hear to a certain extent, and by systematically talking to him, he acquired the power of hearing an ordinary tone of voice while in an adjoining room. This case was reported to me by Mr. Graham Bell, of Washington. In most cases, deafness is due to ankylosis, and the use of an ear-trumpet is simply another application of the movement cure.

I have myself seen a child a little over two years of age, just learning to talk, lose its hearing to a marked degree. By persistent teaching on the part of the mother the hearing was much improved, and the child was rescued from a condition of deaf-dumbness. The child is now twelve or thirteen years old, and while the hearing is not perfect, she is far from being a deaf-mute. Many deaf-mutes can hear something. It is very onerous for even a parent to exercise the hearing by the unaided voice, but with instruments like those of Mr. Maloney's, the parent may be induced to undertake the task.

A RHEOSTAT, ADAPTED FOR THE UTILIZATION OF  
INCANDESCENT LIGHTING CURRENTS IN  
MEDICAL PRACTICE; ALSO A CHEAP,  
PERMANENT GALVANIC  
BATTERY.

By G. BETTON MASSEY, M.D.,

PHYSICIAN TO THE NERVOUS DEPARTMENT OF THE HOWARD HOSPITAL; ELECTRO-THERAPEUTIST TO THE  
PHILADELPHIA ORTHOPÆDIC HOSPITAL AND INFIRMARY FOR NERVOUS DISEASES, ETC.

[Read April 27, 1887.]

THE new building of the Orthopædic Hospital having been recently furnished with an incandescent lighting plant for which wires were laid throughout the edifice, I determined to make use of the same current in the treatment of patients in different parts of the house in place of that derived from ordinary galvanic batteries. To do this, it was necessary to use the current as it was delivered to the lamps in full strength from the entire secondary battery, as the many wires necessary to the use of a cell selector were out of the question. The electromotive force of this current is only 60 volts, which is about equal to the full strength of an ordinary gravity battery of 60 cells or of a Grenet battery of 45 cells. It is readily seen, therefore, that I had merely to choose a rheostat or resistance medium that would be efficient with the full strength of any good chemical battery. The wire rheostat was rejected for the double reason that it was expensive, and did not admit of delicate gradations; and the water tube, because it would have to be long to be efficient, and with the rod pulled up would be awkward in use.

The rheostat exhibited to you to-night is free from all of these objections, and is, as you see, an exceedingly handy instrument. It consists merely of a broad line of pencil mark on roughened glass extending around the greater part of a circle.<sup>1</sup> One end of this broken

<sup>1</sup> A straight pencil-mark rheostat was shown by Dr. Jacobi to the American Neurological Society in 1885.



circle of pencil mark is connected with a terminal of the battery, and the circuit is completed by a circular switch which makes contact with the pencil mark by means of a small metallic wheel. A greater or less length of plumbago is thus included in the circuit with ease, and this material thinly spread out being a poor conductor, a great range of resistances is obtained. In connection with the rheostat a milliamperemeter must always be used, the hand being on the rheostat and the eye on the meter. With this rheostat and a meter attached to a battery all cell selectors may be dispensed with, and the whole battery used simultaneously and evenly. The instrument before you has been constructed by Mr. Flemming, and is elegantly mounted with the meter on a ward table for use at the bedside. Connection with the mains is made by thrusting a plug attached to the table into receptacles in the base boards near each bed in the wards and beneath the lamps in the private rooms.

I have also to show you to-night a new galvanic cell devised by myself for use in a permanent cabinet or shelf battery. Its chief advantages are: the cheapness of the materials used, its freedom from local action and creeping salts, and the long intervals that it will run without being touched. It consists of a zinc rod, such as is sold for use in the Leclanché cell, clasped by rubber bands to a carbon rod, and resting in a saturated solution of chloride of ammonium and bichromate of potassium in simple water. The carbon rod is one of those used in the arc light lamps, and, like the zincs, is both plentiful and cheap, one carbon rod broken in half serving for two cells. The containing jar is an ounce quinine bottle, such as is sold by Powers & Weightman. Before attaching the wires to the carbons by winding and twisting, as shown in one cell, or by the pin-and-hole arrangement, as shown in another, the tops of the carbons must be treated with boiling paraffine to prevent interstitial creeping. The elements are kept about half an inch apart by blocks of soft rubber. The permanence of the cell is greatly improved by greasing the inside of the necks of the bottles and covering each with a piece of thin rubber to prevent evaporation. Sixty cells give a strong and reliable battery, and I would estimate the electro-motive force at fully a volt per cell. The total cost of the materials is only twelve cents per cell.

## DISCUSSION.

DR. C. SEILER said: Some months ago Dr. Massey called my attention to the form of rheostat which he has presented to night, which was a modified form of one exhibited by Dr. Jacobi at the meeting of the American Neurological Society, three years ago. Looking up the subject, I found that a similar contrivance was suggested by Professor Phillips, in the *Philosophical Magazine*, 1870, No. 46, page 41. He shows that such a rheostat will not answer for accurate measurement, as moisture and other conditions affect the resistance in the course of a few days. For medical purposes, however, this variation is so trifling that it does not amount to much. The only objection that I can see to this instrument is that the current has to leap from one particle of plumbago to another, for, with the microscope it will be seen that the particles do not join each other. I am now trying to arrange the rheostat so that the plumbago will be continuous.

DR. MASSEY said: The apparatus described by Dr. Jacobi was straight instead of circular in form. The failure of the instrument to record the same amount of resistance on different days is of no importance, as we must rely on the milliamperemeter to register the strength of the current. It is entirely unnecessary to graduate these current controllers in any way, as their only use is to vary the strength without shock. In reply to Dr. Seiler's remarks about the current leaping from particle to particle, I would remark that all the effects of the currents traversing these pencil marks, show that they do not differ from continuous currents through any other media. The objection to a graphite line that would be continuous under the microscope, is that it would not present enough resistance to be of service.

## DIAGNOSTIC VALUE OF TUBERCLE BACILLI IN SPUTA.

By M. H. FUSSELL, M.D.

[Read April 27, 1887.]

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IN looking over the literature relating to this subject I have found but few writers among Americans, while the foreign journals of 1883 and 1884 contain numerous articles pertaining to it. At that time the subject was new, and it might be objected that the writers in those years were carried away by the glamour of the subject. That objection, at least, cannot be made to an article written now, five years after Koch's discovery, and more than four years since its application to the examination of sputa.

Without exception the writers spoken of above agree that, as a diagnostic sign of phthisis, tubercle bacilli found in sputa are of the greatest practical importance.

Heron (*Lancet*, February 3, 1883) examined sputa from 62 cases and found bacilli in all but 3. He comes to the conclusion that "the presence of the bacillus of tubercle in sputum is sufficient to fix the identity of certain cases of disease."

West (*Lancet*, February 25, 1883) thinks bacilli in sputa may be of diagnostic value in some doubtful cases, but generally they are in confirmation of what is made plain by physical signs.

Williams (*Lancet*, February 24, 1883) examined 130 specimens of sputum. 21 cases were of various diseases other than phthisis, asthma, bronchitis, etc.; 109 cases of various forms of phthisis: 106 of the 109 cases contained bacilli.

Séc is a firm believer in the diagnostic value of tubercle bacilli in sputa.

Dreschfeld examined 46 cases in which physical signs were marked, and 3 doubtful cases—2 with no physical signs, 1 with an apex catarrh only. He concludes that tubercle bacilli in sputa are of the greatest diagnostic value, but of no prognostic value.



Licht found bacilli in sputa of all of 12 cases of phthisis.

Heron (*British Med. Journal*, April 28, 1883) found tubercle bacilli in sputa of 116 cases. In the majority of cases there could have been no reasonable doubt because of the physical signs, but in a few cases where bacilli were found there were but few physical signs.

Marchiafava and Celli are quoted in the *London Med. Record*, of January 15, 1886, as having found Koch's bacillus in sputa of 15 cases of phthisis, in 1 case of slight catarrh of apex, and in 1 case of hæmoptysis without signs. They failed to find it in 6 cases of chronic bronchitis and 1 case of syphilitic inflammation.

Negri and Pinolini (*London Med. Record*, January 15, 1886) diagnosed phthisis by the examination of sputum and confirmed the diagnosis by subsequent physical examination.

Voblyi (*British Med. Journal*, 1883) found tubercle bacilli in sputa of all of 35 cases of phthisis. No tubercle bacilli were found in 18 cases of various other lung diseases. In some of the cases of phthisis the physical signs were at first meagre, but became more evident after a time.

Dreschfeld (*British Med. Journal*, February 17, 1883) examined sputa of 3 cases of hæmoptysis without evident physical signs of phthisis. Tubercle bacilli were found in all the cases.

Prudden (*N. Y. Med. Record*, April 14, 1883) examined 58 specimens of sputa. Tubercle bacilli were present in 46 cases.

Austin Flint, Sr., says the results of the examinations of various specimens of sputa for tubercle bacilli satisfy him that bacilli in sputum may be relied upon as proof of the existence of tuberculous disease.

If repeated examinations made with sufficient care show the presence of tubercle bacilli, the diagnosis of phthisis is positive; and, on the other hand, if on repeated and careful examinations tubercle bacilli be *not* found, phthisis may with much probability be excluded.

"I return to predict that the time will soon come when, in order to corroborate the diagnosis and as the hinge on which the diagnosis will turn in certain cases, microscopical examinations of the sputa will be considered as much a matter of course as examinations of urine for evidence of renal disease."

My personal observations as set forth below confirm the above opinions and enable me to reaffirm that the presence of tubercle bacilli in sputa is diagnostic proof of the presence of tuberculous phthisis. In the examination of my cases I used a modification of Gibbe's method suggested by Prof. Wm. Osler.

The sputum was spread as thinly as possible on a clean cover-glass,

allowed to dry in the air, and passed quickly two or three times through the flame of a spirit lamp. The cover-glass was then immersed in solution of magenta, manufactured by Beek & Co., and allowed to remain fifteen minutes after first slightly heating. It was then decolorized in alcohol, acidified with hydrochloric acid (four or five drops to a watchglassful of alcohol), and examined under a moderately high power.

In this manner the whole proceeding can be done in less than half an hour. If bacilli were not found by the rapid method, however, the glasses were allowed to remain in magenta over night, and then examined as before. The power used at first was Hartnaek No. 9 immersion, afterward 7 objective, 4 eyepiece. Lower power may be used, however, by one perfectly familiar with the bacillus. I have used a Zentmeyer one-fifth with A eyepiece.

The sputa from 100 cases of lung disease were examined.

For convenience we may divide these cases into two classes, I. and II.

Class I. contains 84 cases. The sputa of all of these cases contained tubercle bacilli.

Class II. contains 16 cases. Tubercle bacilli were *not* found in sputa from any of these cases.

Each of the above classes may be subdivided—

#### Class I.

Subdivision A contains 79 cases in which there were evident physical signs of phthisis.

Subdivision B contains 5 cases in which there were few or no physical signs of phthisis. The diagnosis was made by the presence of bacilli in the sputa.

#### Class II.

Subdivision C contains 8 cases in which phthisis was *not* suspected from the physical signs, and no bacilli were found.

Subdivision D contains 8 cases in which the physical signs led to a suspicion of phthisis, but the absence of tubercle bacilli and the subsequent history proved it to be absent.

It is in such cases as those of subdivisions B and D that the presence or absence of tubercle bacilli in the sputa is of such practical value, and it will be well to take these cases in detail, referring the more curious to the summary attached for an account of each case.

We will first give our attention to the five cases under subdivision B, or those in which the physical signs did not warrant a diagnosis of phthisis and in which tubercle bacilli were found, the subsequent history

proving the correctness of a diagnosis of phthisis made after examination of the sputa.

CASE XVII. (Summary.)—Thomas R., aged forty-one, of good family history. Cough, hectic, and loss of flesh for eight weeks. Physical signs at first examination were entirely inadequate to base a diagnosis of phthisis upon. Examination of sputa at second visit showed the presence of myriads of tubercle bacilli. Afterward, consolidation at right apex developed. The case ran a rapid course, and death took place within the year.

CASE XVIII. (Summary.)—Annie W., aged thirty-five. Husband died of phthisis six months before patient came under observation. She was suffering from extreme dyspnœa and cough. Œdema of feet, having had an attack of general œdema some weeks previously. Examination of chest showed a mitral systolic murmur. The heart was beating very rapidly. The symptoms were attributed to the heart lesion. No signs of consolidation could be found after careful examination. On examination of sputa it was found loaded with tubercle bacilli. She was admitted to the University Hospital; gradually failed; her chills and fever becoming more marked. Repeated examination of sputa always showed bacilli; finally, signs of consolidation at right apex developed.

CASE XIX. (Summary.)—Mary C., aged twenty-one. Both parents dead of phthisis; cough, hectic, loss of flesh. Examination of throat showed the presence of a polypoid growth. Physical signs were inadequate to base a diagnosis upon, though there were some signs of congestion at right apex. Examination of sputa showed numerous tubercle bacilli. Rapid consolidation took place; death in eight months at the Episcopal Hospital.

CASE XX. (Summary.)—Mrs. R., aged thirty. Cough, slight expectoration, meagre physical signs. A few tubercle bacilli found. Eight months have passed since the first examination. In the meantime the woman has become pregnant, and her health has improved, though the cough still remains. January 17, 1887, child born; cough returned, sputa reëxamined, bacilli found. More evident signs of consolidation at apex.

CASE C. (Summary.)—Mrs. H., aged thirty-five. Good family history. There was an attack of pneumonia three years ago. Since then health has been gradually failing. Now there are cough, hectic, loss of flesh. Slight consolidation at left apex. This woman was taken for consultation to one of the first diagnosticians of the city. The consolidation was recognized, but the case pronounced one of a probable catarrhal character. The sputa from this case were afterward given to me, and myriads of tubercle bacilli found. April 21, the case has grown rapidly worse, and death is expected daily.

As was stated in the history of these cases, the physical signs did not warrant a diagnosis of phthisis. The examination of the sputa was made because the cases were doubtful and interesting, for the sake of making the diagnosis. Though no better in these instances for the patient, it was a comfort to the physician as a diagnostician when the histories proved the correctness of his diagnosis of phthisis.

No less interesting and instructive than the above are the eight



cases coming under subdivision D, where the history and physical signs gave a strong suspicion of phthisis. No bacilli were found in any case, and complete recovery took place in five of the cases, two became much better, and one died of the results of an acute, and, as I claim, croupous pneumonia.

CASE I. (Summary.)—William K., aged twenty-six. Family history of phthisis. Cough, loss of flesh, hectic. Consolidation at left base. No bacilli were found. Under treatment lung cleared up, and one year afterward returned to the dispensary entirely well of lung trouble.

CASE II. (Summary.)—C. M., aged twenty-nine, with a family history of phthisis. Had an attack of hæmoptysis in the fall of 1884; during that winter severe cough and loss of flesh. There were physical signs of consolidation at left apex. No bacilli were found after careful and repeated examinations. The man gradually improved, and now, April, 1887, is apparently well, though there is still some dulness at left apex; he is able to work and does not complain.

CASE III. (Summary.)—Walter L., aged twenty. Good family history. Cough for one month. A sudden, profuse hemorrhage. There were slight fever and signs of congestion at left apex. No bacilli were ever found. One year afterward no return of trouble, and seems perfectly well.

CASE VI. (Summary.)—K. H., aged thirty-five, with a good family history, had an attack of pneumonia eighteen months before she came under observation (declares she was perfectly well before). Since then has had cough, hemorrhage, hectic, loss of strength but not of flesh, copious expectoration. On examination a large cavity was found at right apex. Repeated careful examinations failed to show tubercle bacilli. This patient remained under observation for six months, and was in about the same condition as at first. This must have been either a cavity due to breaking down of lung following pneumonia, or, as Professor Flint suggests, one in which the tubercular process had become cured or was dormant.

CASE VII. (Summary.)—A girl, aged seven. Perfectly well until ten weeks before she came under observation. At that time she had an attack of what was apparently acute pneumonia of the right apex. She did not rally. The lung broke down and at the time she was seen there was a cavity at right apex. The patient died from exhaustion four weeks after. No bacilli were ever found in sputum.

CASE VIII. (Summary.)—Alma N., aged twenty-five. Uncle died of phthisis. Cough, with slight loss of flesh for three months. The left apex dull, full of mucous râles, prolonged expiration. No bacilli found after repeated examinations. The lung cleared up, cough stopped, and one year after patient seemed perfectly well.

CASE XIV. (Summary.)—John C., aged sixty-six. For four months there had been cough, hectic, sweats, and loss of flesh. There were signs of consolidation at right base. Under treatment the lung cleared up and the man made a good recovery. Repeated examination failed to show bacilli.

CASE XV. (Summary.)—Sallie K., aged twenty-nine. Good family history. About one month before she came under observation began to have cough,

fever, pain, rapid loss of flesh. She was found in bed, emaciated, with slight fever, 101° F., extreme dyspnoea, diarrhoea, and presented the picture of one in advanced phthisis, indeed such had the case been pronounced. I found but few physical signs. There was consolidation at left base, however. Repeated examination failed to show bacilli. Under vigorous treatment the patient revived and now is perfectly well. Evidently a case of neglected pneumonia.

Of the 79 cases belonging to subdivision A there could have been no reasonable doubt of the existence of phthisis basing the opinion on the physical signs present. Tubercle bacilli were found in each case.

Subdivision C contained 8 cases, 2 of chronic pleurisy and 6 of chronic or subacute bronchitis. The sputa from each case were repeatedly examined but no bacilli were ever found.

As most of the cases reported were taken from my service at the University Medical Dispensary, and as dispensary cases, as a rule, are not long under observation, it is impossible to draw any positive conclusions from these cases as to the relation between the bacillus and prognosis in phthisis, but in Cases XVII., XIX., and LXXVII., which ran a fatal course within a year, and in Cases XXXI., XXXIII., XXXVII., XXXIX., XLVIII., LVI., LXXVI., XCVI., which were examined near to the time of death, tubercle bacilli were unusually abundant. Especially was this the fact in Case LVI., which was examined about ten days before death. In conclusion, I wish to acknowledge my indebtedness to Prof. Osler, to whom I owe my knowledge of the *technique* of the work, and to Drs. John H. Musser, of Philadelphia, and R. R. Bunting, of Roxborough, for opportunity given to examine sputa of their cases.

#### SUMMARY OF ONE HUNDRED CASES.

CASE I.—William K., aged twenty-six. Mother and one sister died of phthisis. Cough, loss of flesh for three months. Consolidation and râles at base of left lung. No bacilli. Recovery after three months.

CASE II.—C. M., male, aged twenty-nine. Brother died of phthisis. Cough, hæmoptysis, hectic, loss of flesh. Consolidation at left apex. No bacilli. Good health after two years.

CASE III.—Walter L., aged twenty. Good family history. Sudden hæmoptysis. Signs of bronchial catarrh at left apex. No bacilli. Recovery after two years.

CASE IV.—Robert B., aged twenty. Good family history. Cough, with profuse expectoration for ten years. Bronchiectatic cavity at root of left lung. No bacilli.

CASE V.—William T., aged forty-eight. Good family history. Cough, dyspnoea for several years. Chronic pleurisy of left chest. No bacilli.

CASE VI.—Kate H., aged thirty-five. Good family history. Cough, pro-

fuse expectoration, hemorrhage, following attack of pneumonia. Large cavity at right apex. No bacilli. Condition the same after one year.

CASE VII.—Annie S., aged eight. Good family history. Acute lobar pneumonia. Cavity at right apex. No bacilli. Death in twelve weeks.

CASE VIII.—Alma N., aged twenty-five. Uncle died of phthisis. Cough, loss of flesh for three months. Consolidation at right apex. No bacilli. Recovery.

CASE IX.—Robert K., aged forty-eight. Good family history. Asthmatic emphysema, chronic Bright's disease. No bacilli.

CASE X.—Mr. L., aged forty. Good family history. Cough for three or four weeks. Signs of acute bronchitis. No bacilli.

CASE XI.—John Mc., aged seventy-three. Son died of phthisis. Cough for years. Emphysema, chronic Bright's disease. No bacilli.

CASE XII.—Clarissa W., aged fifty. Good family history. Cough, dyspnoea, emphysema, chronic bronchitis. No bacilli.

CASE XIII.—Michael C., aged twenty-seven. Good family history. Cough for one year. Old pleurisy at left base. No bacilli.

CASE XIV.—John C., aged sixty-six. Good family history. Cough, night-sweats, hectic for four months. Consolidation at right base. No bacilli. Recovery.

CASE XV.—Sallie K., aged twenty-nine. Good family history. Cough, loss of flesh, dyspnoea for one month. Consolidation at left base. No bacilli.

CASE XVI.—Mrs. M., aged fifty-five. Good family history. Cough, dyspnoea, loss of flesh for two years, chronic bronchitis. No bacilli.

CASE XVII.—Thomas R., aged forty-one. Good family history. Cough, loss of flesh, hectic for eight weeks. Meagre physical signs; bacilli found. Rapid consolidation at right apex. Death in one year.

CASE XVIII.—Annie W., aged thirty-five. Husband died of phthisis six months before observation. Dyspnoea, cough, œdema, mitral heart trouble. No lung signs. Bacilli found. Gradual consolidation at right apex.

CASE XIX.—Mary C., aged twenty-one. Parents died of phthisis. Cough, hectic, loss of flesh and strength. Meagre signs at first examination. Bacilli found. Rapid consolidation at right apex. Death in one year.

CASE XX.—Mrs. R., aged thirty. Good family history. Cough, hectic, loss of flesh. Meagre physical signs. Bacilli found. Gradual consolidation at right apex. Failure of health.

CASE XXI.—Tilly Y., aged twelve. Mother and two sisters died of phthisis. Cough, loss of flesh, hectic, cavity in left apex. Bacilli found.

CASE XXII.—Samuel W., aged thirty-six. Father died of phthisis. Hemorrhage one year ago. Consolidation at left apex. Bacilli.

CASE XXIII.—Mary M., aged eighteen. Good family history. Cough, failure of strength. Consolidation at right apex. Bacilli.

CASE XXIV.—Samuel H. Mother died of phthisis. Cough, hemorrhage, loss of flesh. Consolidation at left apex. Bacilli found.

CASE XXV.—William K., aged thirty. Mother died of phthisis. Cough, hectic, loss of flesh, hæmoptysis. Consolidation at left apex. Bacilli. Death.

CASE XXVI.—Eliza C., aged fifty-eight. Mother died of phthisis. Cough, hectic, loss of flesh, hemorrhage. Consolidation at left base. Bacilli found.

CASE XXVII.—Miss W., aged twenty-three. Good family history.



Cough, loss of flesh, night-sweats. Extensive consolidation at right apex. Bacilli found.

CASE XXVIII.—Michael W., aged twenty-eight. Good family history. Cough, hectic, loss of flesh, hæmoptysis. Consolidation at right apex. Bacilli.

CASE XXIX.—Patrick G., aged fifty-one. Cough, loss of flesh, hectic, sweats, hæmoptysis. Consolidation at right apex. Bacilli.

CASE XXX.—Thomas E., aged twenty-five. Good family history. Cough, sweats, hectic, loss of flesh for eighteen months. Consolidation at left apex. Bacilli.

CASE XXXI.—Mary Y., aged fifty. Two daughters died of phthisis. Cough, loss of flesh, sweats, hectic, hæmoptysis. Cavities at both apices. Bacilli.

CASE XXXII.—Thomas B. Mother died of phthisis. Cough, hectic, hæmoptysis. Cavity at both apices. Bacilli.

CASE XXXIII.—Thomas S., aged twenty-eight. Sister died of phthisis. Cough, loss of flesh, hectic, hæmoptysis. Cavity at right apex. Bacilli.

CASE XXXIV.—John T. Good family history. Cough, loss of flesh, hæmoptysis. Consolidation at right apex. Bacilli.

CASE XXXV.—Bessie J., aged sixteen. Mother and sister died of phthisis. Cough, hectic, loss of flesh, hæmoptysis. Consolidation of whole of left lung. Bacilli.

CASE XXXVI.—Annie K., aged thirty-six. Good family history. Cough, hectic, loss of flesh, hæmoptysis. Cavity at left apex. Bacilli.

CASE XXXVII.—Maggie C., aged twelve. Sister died of phthisis. Cough, hectic, loss of flesh. Consolidation with cavity in left chest. Bacilli. Death.

CASE XXXVIII.—Archie G., aged forty-four. Two sisters died of phthisis. Cough, hectic, loss of flesh. Left lung consolidated. Bacilli.

CASE XXXIX.—Annie S., aged thirty. Father, mother, and sister died of phthisis. Cough, hectic, loss of flesh, hæmoptysis. Consolidation at left, cavity at right apex. Bacilli.

CASE XL.—Kate J., aged twenty-two. Father died of phthisis. Cough, hæmoptysis, loss of flesh, hectic. Consolidation at right apex. Bacilli.

CASE XLI.—John L., aged thirty-one. Father died of lung trouble. Cough, hectic, loss of flesh, sweats. Cavity at right apex; developed pyo-pneumothorax. Bacilli.

CASE XLII.—Peter Mc., aged twenty-nine. Father died of phthisis. Cough, hectic, loss of flesh, dyspnœa, hæmoptysis. Cavity at right mammary region. Bacilli.

CASE XLIII.—Frederick H., aged thirty-three. Father and brother died of phthisis. Cough, hectic, sweats, hæmoptysis. Cavity at right apex. Bacilli.

CASE XLIV.—William R., aged twenty-six. Father and sister died of phthisis. Cough, hectic, hæmoptysis, loss of flesh. Consolidation of left lung. Bacilli.

CASE XLV.—Edward Mc., aged twenty-eight. Father died of phthisis. Cough, loss of flesh, hectic. Cavity at left base. Bacilli.

CASE XLVI.—Kate J., aged twenty. Good family history. Cough, sweats, hectic, loss of flesh. Consolidation at left apex. Bacilli.

CASE XLVII.—Ellen W., aged twenty-eight. Good family history. Cough, hectic, loss of flesh. Consolidation at left apex. Bacilli.

CASE XLVIII.—Aquilla D., aged seventy-one. Good family history. Cough, hectic, loss of flesh, hemorrhage. Cavity at left apex. Bacilli.

CASE XLIX.—John C., aged twenty-nine. One brother died of tubercular meningitis. Cough, hectic, loss of flesh, involvement of both lungs. Bacilli.

CASE L.—James W., aged twenty-nine. Good family history. Cough, hectic, hæmoptysis. Consolidation at left apex. Bacilli.

CASE LI.—William O., aged forty-seven. Good family history. Cough, hectic, sweats, loss of flesh. Cavity at left apex. Bacilli.

CASE LII.—James B., aged nineteen. Good family history. Cough, hectic, loss of flesh. Great involvement of right apex. Bacilli.

CASE LIII.—Thos. S., aged twenty-two. Good family history. Cough, hæmoptysis. Incipient consolidation at right apex. Bacilli.

CASE LIV.—Maggie S., aged twenty-six. Cough, hectic, hæmoptysis. Consolidation at right apex. Bacilli.

CASE LV.—James S., aged thirty-six. Cough, night-sweats, hectic, loss of flesh. Consolidation at right apex. Bacilli.

CASE LVI.—Wm. K., Sr., aged forty. Son died of phthisis. Cough, hectic, loss of flesh, hemorrhage. Cavity at right apex. Bacilli.

CASE LVII.—Sarah G., aged twenty-four. Good family history. Cough, sweats, hectic, hæmoptysis. Cavity below right nipple. Bacilli.

CASE LVIII.—Sarah W., aged twenty-four. Good family history. Cough, hectic, loss of flesh, hæmoptysis. Consolidation at right apex. Bacilli.

CASE LIX.—Mrs. M., aged thirty-six. Father died of phthisis, child died of tubercular meningitis. Cough, dyspnœa, hectic, loss of flesh, hæmoptysis. Consolidation at both apices. Bacilli.

CASE LX.—Mary C., aged twenty-six, colored. Five brothers died of phthisis. Sweats, cough, hectic, loss of flesh. Cavity at right apex. Bacilli.

CASE LXI.—Henry B., aged thirty-one. Good family history. Cough, sweats, hectic. Consolidation at both apices. Bacilli.

CASE LXII.—Thos. W., aged twenty. Mother and aunt died of phthisis. Cough, sweats, hectic, loss of flesh, bloody urine and casts. Consolidation at left apex. Cavity with pyopneumothorax. Bacilli.

CASE LXIII.—Chas. C., aged twenty-eight. Mother and two sisters died of phthisis. Cough, hæmoptysis. Consolidation at right apex. Bacilli.

CASE LXIV.—Eliz. S., aged thirty-seven. Good family history. Cough, hectic, some blood. Consolidation at right apex. Bacilli.

CASE LXV.—David A., aged twenty-four. Good family history. Cough, hectic, for one year; effusion filling right chest; râles in lung at apex. Bacilli.

CASE LXVI.—Kate S., aged forty-two. Good family history. Cough, dyspnœa, hæmoptysis. Consolidation at right apex. Bacilli.

CASE LXVII.—Nellie Mc., aged twenty. Good family history. Cough, loss of appetite and flesh. Consolidation at left apex. Bacilli.

CASE LXVIII.—James Boyle, aged twenty-seven. Two sisters died of phthisis. Loss of flesh, cough for four months. Consolidation at right apex. Bacilli.

CASE LXXIX.—Daniel Mc., aged twenty-nine. Mother died of phthisis. Cough, hectic, loss of flesh. Consolidation at left apex. Bacilli.

CASE LXX.—James M., aged nineteen. Good family history. Cough, profuse hemorrhage. Consolidation at right apex. Bacilli.

CASE LXXI.—Mrs. S. Mother and all mother's family died of phthisis. Cough, loss of flesh, hectic, hemorrhage. Cavity at left apex. Bacilli. Death.

CASE LXXII.—Mrs. W. Mother and one daughter died of phthisis. Cough, loss of flesh, hectic, hemorrhage. Cavity. Bacilli. Death.

CASE LXXIII.—Mrs. E., aged forty. All father's family and two sisters died of phthisis. Cough, hemorrhage, hectic. Cavity at right apex. Bacilli.

CASE LXXIV.—John E., aged sixteen. Good family history. Cough, hectic, loss of flesh. Cavity at left apex. Bacilli.

CASE LXXV.—Mrs. D., aged twenty-five. Brother died of phthisis. Loss of flesh, hectic, hemorrhage. Cavity at both apices. Bacilli. Death.

CASE LXXVI.—Greenwod, F., aged thirty-two. Good family history. Cough, hectic, loss of flesh, hemorrhage. Involvement of both chests. Bacilli. Death.

CASE LXXVII.—Eugene Mc., aged twenty-three. Cough, hemorrhage, hectic, loss of flesh. Cavity at left apex. Bacilli found immediately after initial hemorrhage. Death within a year.

CASE LXXVIII.—Mrs. F., aged thirty. Good family history. Cough, hectic, loss of flesh. Consolidation at left apex. Bacilli.

CASE LXXIX.—Mrs. K. Loss of flesh, expectoration, hectic, cough. Consolidation at left apex. Bacilli.

CASE LXXX.—Mrs. C., aged twenty-six. Good family history. Hectic, loss of flesh. Consolidation at right apex. Bacilli.

CASE LXXXI.—Maggie M., aged twenty-five. Sister died of phthisis, child died of tubercular meningitis. Hectic, cough, loss of flesh, hæmoptysis. Bacilli. Death.

CASE LXXXII.—Richard R., aged nineteen. Father died of phthisis. Hectic, cough, loss of flesh. Consolidation at left apex. Bacilli. Death.

CASE LXXXIII.—Mrs. A., aged twenty-three. Good family history. Cough, hectic, loss of flesh. Consolidation at right apex. Bacilli.

CASE LXXXIV.—Rose R., aged twenty. One sister died of phthisis. Cough, hectic, loss of flesh. Consolidation at left apex. Bacilli.

CASE LXXXV.—Stephen M. Good family history. Cough, hectic, loss of flesh. Consolidation at right base. Bacilli.

CASE LXXXVI.—Miss G., aged twenty-two. Good family history. Cough, hectic, loss of flesh, sweats. Consolidation and softening at right base. Bacilli.

CASE LXXXVII.—Henry B., aged twenty-six. Father and paternal uncles and aunts died of phthisis. Cough, hectic, laryngitis. Cavity at right apex. Bacilli.

CASE LXXXVIII.—Geo. N., aged twenty-four. Good family history. Loss of flesh, blood, hectic, dyspnœa, cough. Cavity at right apex. Bacilli.

CASE LXXXIX.—Mary G. One sister died of tubercular meningitis. Loss of flesh, cough, hemorrhage. Extensive disease of left lung, beginning consolidation of right. Bacilli.

CASE XC.—James Mc., aged thirty-seven. Good family history. Cough,



hectic, loss of flesh. Cavity at left apex, beginning consolidation at right. Bacilli.

CASE XCI.—Anthony B., aged twenty-five. Good family history. Cough only one month; slight disease at left axillary line. Bacilli.

CASE XCII.—Rebecca C. One brother died of phthisis. Cough, hectic, loss of flesh. Disease of both apices. Bacilli.

CASE XCIII.—Lawrence C., aged fifty-eight. Good family history. Cough, hectic, loss of flesh. Cavity at right apex, consolidation at left. Bacilli.

CASE XCIV.—Eliza T., aged thirty-two. Mother died of phthisis. Cough, hectic, loss of flesh, sweats. Consolidation at right apex. Bacilli.

CASE XCV.—Sophia Z., aged twenty-five. Good family history. Dyspnœa, cough. Effusion in right chest, râles at apex. Bacilli.

CASE XCVI.—Mrs. W., aged forty-four. Mother died of phthisis. Cough, hectic, loss of flesh. Cavity at right apex, softening at left. Bacilli. Death.

CASE XCVII.—Jane M. Good family history. Cough, hectic, loss of flesh. Advanced disease at right apex. Bacilli.

CASE XCVIII.—Chas. T., aged sixty-three. Son has phthisis. Cough, dyspnœa, hectic, hæmoptysis. Consolidation at left apex. Bacilli. Death.

CASE XCIX.—Mrs. E., aged forty-seven. Sister died of phthisis. Cough, hectic, loss of flesh. Cavity at right apex. Bacilli.

CASE C.—Mrs. H., aged thirty-five. Good family history. Consolidation at right apex. Bacilli.

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## DISCUSSION.

DR. W. OSLER said: I think that the importance of the tubercle bacillus in the sputum as a means of diagnosis is not sufficiently recognized by the profession. The technical skill required is not very great, and the time required with the rapid methods of staining is not more than fifteen to thirty minutes. I have succeeded in demonstrating the bacillus within five minutes of the time that the sputum was put upon the slide. This examination is particularly serviceable in just those cases where the evidences of disease are very slight. Only within the past few weeks there was in the University Hospital a man without any pulmonary signs, who had been failing in health and had slight fever. The condition was attributed to some obscure abdominal disease. Finally a suspicion arose that there might be some trouble with the lung, and the sputa were examined and the bacilli found. The signs of phthisis have since developed. The power required for these examinations, as Dr. Fussell says, need not be very high.

## LAPAROTOMY FOR PERITYPHLITIC ABSCESS.

BY FRANK WOODBURY, M.D.

[Presented April 27, 1887.]

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I HAVE here the specimens removed by laparotomy in a case of perityphlitic abscess. The specimens consist of the vermiform appendix which is perforated by an ulcer, and a piece of omentum infiltrated with lymph. These tissues were found in the interior of an abscess, and in this abscess was found a concretion, probably fecal, something larger than a cherry-stone. The details of the history of the case are interesting:

One week ago to-day a gentleman, twenty-six years of age, called at my office, complaining of pain in the muscles in different parts of the body, but more especially of malaise; he stated, also, that he passed large quantities of limpid, clear urine. After examination I concluded that he was in all probability suffering with congestion of the liver and kidney as a result of exposure to cold. The urine was found to contain one-fifth albumen, and, on careful examination, I found a number of leucocytes and epithelial cells, and one hyaline cast, slightly granular. He was ordered calomel in fractional doses, to be followed by a saline laxative. This produced an evacuation of the bowels and an improvement in the general appearance, and when he reported himself the next day, he looked and felt better. On account of the irritation of the kidney, I gave him a mixture containing bicarbonate of sodium. This was last Thursday. He returned on Friday during my absence. I found him in the water-closet, and he stated that he could stay there all day, as he had been passing water almost every five minutes. He was greatly prostrated. I gave him a little morphia, and he took a sleep in the office and returned home. On Sunday he had a bad night. He now complained of severe pain in the right inguinal region, and a lump was for the first time observed in the abdomen, to the right side, about two inches above the middle of Poupart's ligament. The bowels had not been moved since Friday. I then ordered a few more calomel powders with copious drinks of hot water, which produced several copious evacuations. Sunday afternoon the temperature was 103.5°. On Monday the lump was decidedly larger and potato-shaped, suggesting intussusception. At my suggestion, Dr. James C. Wilson saw the case in consultation, and we came to the conclusion that there was probably intussusception, although there had been no decided obstruction and no discharge of

blood; nor had there been any vomiting. In order to relieve the pain, eight Swedish leeches were applied over the tumor, and during the night morphine was given. He was somewhat better yesterday. This morning, when I saw him, his condition was bad. His tongue was dry and brown, and his pulse was weak and rapid. The inflammation was now more superficial, and I suggested that a surgeon be called in consultation. Dr. Thomas G. Morton saw the patient with me at eleven o'clock, and at two o'clock Drs. Morton, Wilson, Rhodes, and myself performed laparotomy, making an incision about ten inches long. We found the superficial tissues infiltrated with pus, which welled out when the transversalis fascia was cut. Going through the peritoneum, an abscess was found, and fishing out the cæcum and vermiform appendix, we found this large perforation, which is seen in the specimen. A silk ligature was applied near the origin of the enlarged appendix, and also near its extremity, and the site of the ulceration and the intervening portion removed. The operation was done with all antiseptic precautions and a drainage tube was inserted into the bottom of the abscess. The temperature of the patient is nearly a degree lower ( $98.6^{\circ}$ ) this evening than it was this morning.

I have mentioned the fact that early in the illness a large quantity of urine was passed. On Sunday, and again yesterday, he passed a small quantity of blood in his urine. Probably the abscess was pointing into the bladder. The position of the tumor was unusual. The protrusion was almost in the median line. It was this that made us hesitate about adopting the diagnosis of perityphlitic abscess. I learned to-day, for the first time, that the patient had been subject to occasional attacks of cramps in the stomach for a year or two, but these were not referred especially to the right side.

On making the section, pus was found in the muscles; and when the peritoneum was reached, it was found thickened, and pus was also under it. As a result of the inflammatory process, the abscess had been shut off from the general peritoneal cavity. The posterior layer of peritoneum I think had in all probability been destroyed by the abscess. A solution of bichloride of mercury (1 to 2000) was used to douche the wound until the peritoneum was opened, when hot water was substituted. The walls of the abscess cavity were scraped with the curette, and all sloughy tissues removed. The wound was closed with deep and superficial catgut sutures, and iodoform applied upon the antiseptic gauze.



## A NEW APPARATUS FOR MAINTAINING THE LITHOTOMY POSITION.

BY THOMAS B. McBRIDE, M.D.

[Read May 11, 1887.]

I DESIRE to present to the Society, this evening, an apparatus I have designed for the purpose of supporting the limbs and maintaining the lithotomy position.

It consists of a piece of hard, elastic wood, preferably ash or hickory,  $\frac{3}{8}$  of an inch thick, 1 inch wide, 36 inches long, bent at each



end in a semicircle of 6 inches diameter, or a semicircumference of  $10\frac{1}{2}$  inches, thus leaving a shaft of 15 inches between the semicircles, and making the finished length of the instrument 27 inches ( $6+15+6$ ).

To the shaft, 2 inches from each end, a buckle is immovably fastened by means of leather.

A band of webbing, finished at each extremity with a leather strap, the whole 50 inches long, completes the device.

In using the apparatus the thighs are flexed on the abdomen and put in the semicircles, the band is placed around the neck and fastened to the buckles.

The advantages are apparent. Its cheapness places it within the reach of every one. The thoroughness with which it does its work, keeping the patient immovably in the lithotomy position, and maintaining the same relative position of the parts; the fact that it does not interfere with the circulation; the strength, lightness, and remarkable simplicity will, I think, render it a valuable acquisition to the surgeon and gynecologist.

## DETERMINATION OF THE SIZE OF THE PUPIL.

By EDWARD JACKSON, M.D.

[Read May 11, 1887.]

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THE extent of the nervous connections which determine the contraction or dilatation of the pupil, and the variety of its reactive and correlated movements, make it an important index of many conditions of the local or general nervous system. But in all the accumulating volumes of loose medical literature, no symptom has been more loosely treated. Off-hand decisions on this matter, such as are commonly made; and their usual records, "pupils dilated," or "pupils contracted," are at best worthless, and often misleading. They are made by reference to a mental standard or conception of what the average size of the pupil should be; which as a conception or understanding may be good enough, but which as a standard to test the case in hand is simply useless and deceptive.

The normal size of the pupil varies completely with the individual. In some normal eyes direct sunlight will not contract the pupil below five mm. in diameter; while in others darkness or even the strongest mydriatic will not dilate them to that extent. In one extreme case, Mrs. M., aged forty, who applied at the Polyclinic for relief from eye-strain due to hyperopia, and whose ocular and general health seemed in all respects good, the widest dilatation we could obtain with atropia or duboisia left the pupils still less than two mm. in diameter.

Again, the size of the pupil varies with age, larger in the young, smaller in the old; causing in the latter really pathological dilatation to be overlooked, while the normal pupil of childhood is set down as "dilated." Then the knowledge that the pupil varies with exposure to light or with accommodation and convergence, though familiar to all of us, is too rarely applied in this connection.

With our present knowledge of the size of the pupil, and the conditions which influence it in health and disease, no examination can be regarded as fairly thorough and satisfactory which does not note—

1st. Its exact size when the gaze is fixed on a distant object, both



in a bright light and in the weakest light in which it can be accurately measured.

2d. Its size when the eyes are fixed on some near object, as the finger held six inches in front of them. This should be measured by a weak light, unless the pupil is unusually dilated.

3d. Its behavior on covering the other eye with something that thoroughly excludes the light.

In an examination for ophthalmic purposes, of course, other matters are to be considered also. Each eye should be examined separately, and any inequality between the pupils especially noted. The report of such an examination should give exact dimensions, or at least the exact diameter of the pupil in a strong light, and other dimensions in their proportions to this, and not be couched in general phrases, which are, for the reasons above alluded to, well nigh meaningless. The bright light referred to, is secured when the eyes are directed toward the open sky in the middle of the day, or toward the flame of a student's lamp or common gas burner not more than ten or twelve inches distant. For the tests by weak illumination the source of light should be removed to one side of the eye, so that the rays may fall obliquely on the pupil. In this way fewer will enter it, and those which do, will fall upon a less sensitive part of the retina. Delay in the reaction to light, or its entire absence, are conveniently tested by observing the pupil through the ophthalmoscope at a distance of eight or ten inches, and (by turning the mirror) alternately leaving the eye in comparative darkness or flooding it with the concentrated light.

For accurately measuring the diameter of the pupil many little pieces of apparatus have been devised, the more important of which I have collected to show you this evening.<sup>1</sup> One of the simplest devices, and a very serviceable one, is the scale of black circles or "pupils," proposed first, I think, by Follin, but more conveniently arranged by our fellow member, Dr. B. A. Randall. This scale is held close to the patient's eye, and the circle selected which most nearly matches the pupil in size, the diameter of this circle being given opposite it on the scale.

Fick proposed to measure the pupil subjectively by means of two apertures in a black diaphragm which should be placed before the eye, one aperture being fixed, the other movable. Each aperture admits light to a certain circular area of the retina, the size of this area being determined by that of the pupil. Thus the appearance of two feebly illuminated circles is produced, and the distance between the apertures

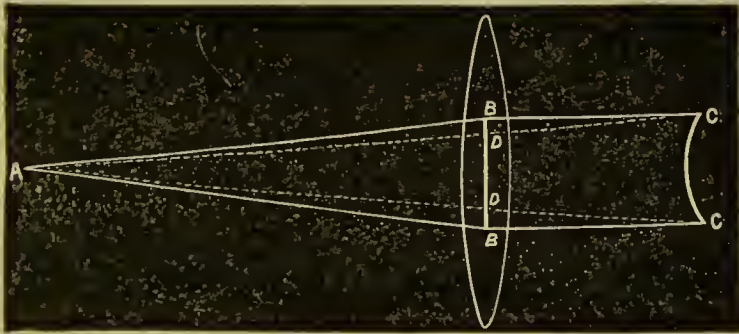
<sup>1</sup> Most of them through the kindness of James W. Queen & Company, opticians, of this city.

being varied until these circles become just tangent, that distance gives, with an easily obtained correction, the diameter of the pupil.

On this plan Cretes<sup>1</sup> constructed this pupilometer, in which the distance between the aperture was made to vary by revolving a disk with a spiral linear aperture which intersected a fixed straight linear aperture; and Robert Houdin devised the other instrument here shown. This subjective method is superior to others in certain experimental investigations, but is of no importance in practice.

The pupil can be measured approximately by simply holding a finely graduated rule in front of it and noting the number of spaces occupied; and various instruments have been devised to do this with precision. All of them, however, except that recommended below, are liable to the objection that the distance subtended on the rule is less than the diameter of the pupil in proportion as the distance from the observer's eye is less to the rule, than to the pupil. This is shown in Fig. 1 by

FIG. 1.



the dotted lines, the scale being represented by B B, and the pupil by C C; D D, although really shorter than the diameter of the pupil, seems to cover it.

A sort of "cross" between this method and the series of black circles is the scale of Mr. Jessop;<sup>2</sup> you see it is a strip of metal, along the edges of which are cut out a series of semicircles of different diameters.

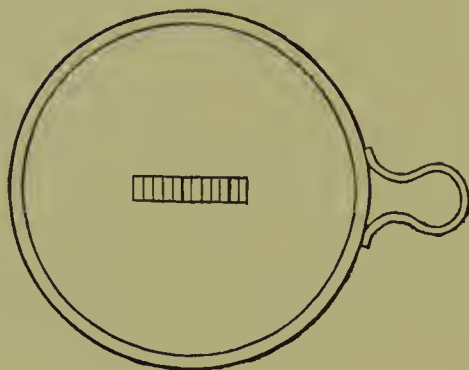
But for measuring the pupil, in the observation of cases, I think the best instrument is the so-called keratometer, Fig. 2, of Priestley Smith, of Birmingham, England, and reproduced by Queen & Co., of Philadelphia. This consists of a scale placed between two plano-convex lenses. The observer's eye is placed about the principal focus

<sup>1</sup> For full descriptions of these and other forms of apparatus, see *Traite Complet d'Ophthalmologie* of de Wecker and Landolt, tom. premier, pp. 942-953.

<sup>2</sup> See *Ophthalmic Review*, November, 1886.

of the combined lenses (ten inches from them), and holding the scale before the observed eye the cornea or pupil subtends on the scale exactly its proper length, whatever its distance from the scale, be-

FIG. 2.



cause rays converging to the principal focus of a lens system must have entered that system parallel. This is illustrated by the solid lines of Fig. 1, A, where the observer's eye is placed, being a principal focus of the lens,  $BC$  and  $BC$  must be parallel; hence  $BB$  exactly equals  $CC$  no matter how far they are apart.

The equality or inequality in the size of the two pupils and abnormalities of shape can be observed without special apparatus, though such apparatus has been devised. But it must be remembered that both inequalities of the two pupils and irregularities of shape are common anomalies of development.

Since the difficulty of determining the presence or extent of pathological alterations of the pupil rests on the lack of general conformity to any standard of size or reactions, any comparative observations on the pupils of the patient in health are of especial value.

The significance of the different conditions of the pupil, which may be observed, is outside the scope of my paper. Probably the best consideration of it is to be found in the chapter on that subject in Swanzy's text-book on *Diseases of the Eye*.

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## DISCUSSION.

DR. G. DE SCHWEINITZ said: I can endorse Dr. Jackson's criticism of the ordinary reports of the conditions of the pupil. It would be equally as valuable in a case of cardiac disease to say simply that there was a murmur, as to describe the pupil in the vague terms usually adopted. I have had no experience with the instrument designed by Priestley Smith. Dr. Randall's instrument has given me complete satisfaction.



## ASTHMA TREATED BY BERGEON'S METHOD.

By S. SOLIS-COHEN, M.D.

[Reported May 11, 1887.]

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By request of the Chairman of the Directors, I will briefly report a case of asthma in which immediate relief followed the injection into the intestine of the mixture of carbon dioxide and hydrogen sulphide, as recommended by Bergeon. Having noticed in Morel's paper reports of two cases in which success attended the experiment in one of the Parisian hospitals, and a case presenting itself which offered a fair test, I determined to make the trial.

The patient is a stout married woman, about fifty years of age, of somewhat neurotic temperament, who has for some years been subject to attacks of spasmodic asthma, ordinarily manifesting recurrent paroxysms, lasting ten or twelve days. In the intervals there is neither bronchitis nor dyspnoea. There is no heart lesion. I have seen her in previous attacks, which have been relieved by methods with which we are all familiar. In one particularly obstinate seizure, by advice of Dr. J. Solis-Cohen, the patient was sent to the gas works, and was benefited by inhaling the carburetted vapors there produced. I saw her on the second or third day of the attack, and proposed the injections, but could not obtain consent. Not wishing to complicate the therapeutics too much, in case she should later accede to the proposal, I simply prescribed, as a palliative for the dyspnoea under which she labored between the paroxysms, *quebracho*, in twenty drop doses of the fluid extract, repeated hourly or half hourly, according to indications. This, of course, gave great relief, but a paroxysm recurring in the evening, the patient consented to try the injection. Almost immediate relief was experienced. Some dyspnoea persisted, but there was no further paroxysm, and the dyspnoea gradually lessened, finally disappearing within thirty-six hours. After six injections, the latter ones being prophylactic rather than therapeutic, the patient professed herself feeling better than for years, and auscultation revealed only normal breath sounds.

This is, of course, but a single case; yet having a standard of comparison in previous attacks in the same individual, I can, so far as one case is worth anything, confirm Morel's claim that the rectal injection of carbon dioxide and hydrogen sulphide is beneficial in asthma. Which of the two gases is the active agent, and whether it would be equally efficacious by inhalation are questions which I do not now desire to discuss.

## CYSTIC ENLARGEMENT OF THE VULVO-VAGINAL GLAND.

By B. F. BAER, M.D.

[Read June 22, 1887.]

THIS case is specially interesting because of the size of the tumor, and of a mistaken diagnosis which had been made.

The patient, thirty-six years of age, married, but sterile, presented herself at the Polyclinie, and stated that she had "a rupture which would not go baek," although she had been kept upon her back as long as two days at a time, and had been bandaged and compressed until she could no longer endure the suffering. Truss after truss had also been adjusted, but all to no purpose. On inquiry, it was learned that, about one year before coming under observation, she noticed a small lump near the posterior commissure of the vulva, corresponding with the location of the vulvo-vaginal gland. It was painless, and gradually increased from below upward. At the time she presented herself it was as large as a duck's egg. During the first nine months of its presence it produced no symptoms, except slight inconvenience from the swelling, but about three months before coming under my notice the tumor began to occasion difficulty on account of its size, and the frietion produced in walking, and from a most interesting symptom, namely, obstruction to the flow of urine. During the act of mieturition the urine would flow regularly for a short time, and then it would suddenly cease, to be followed by great pain. By an effort she could again start the flow, and then it would again abruptly stop. During the last few months, the tumor had so increased in size as to approach the symphysis pubis.

On examination, I found an elastic tumor making compression upon the urethra, and the mechanical interference was at once explained. When the bladder became full, the effort to empty the organ overcame the obstruction from pressure of the mass for a time, but as soon as the straining ceased the urethra would be again suddenly closed by the tumor. It required considerable force to displace the tumor so as to see the urethra. The tumor was not tender on pressure, and there were no signs of inflammatory action about it. There was marked fluctuation, and its size was not affected when the patient was in the recumbent position. The inguinal canal was empty, and there was nothing in the shape or charaeter of the tumor which would indiate that it contained intestine. The diagnosis lay between hernia and hydrocele of the labium majorum, both of which are exceedingly rare, and abscess

or cystic enlargement of the vulvo-vaginal gland, although the tumor was much larger than any I had ever seen from the latter cause. I advised its removal by extirpation, because my previous experience in the treatment of this disease has taught me that radical measures are necessary. The patient entered the hospital, and in the presence of the Polyclinic class I proceeded to operate. An incision was made at the lower and inner surface of the tumor, my intention being to try to enucleate it entire. But the cyst was ruptured by the effort, and a yellowish fluid escaped of the consistency of thick cream, but without odor. I next passed my finger within the collapsed sac, and found that it occupied a very extended surface—from the upper portion of the labium down to the ischio-rectal space. The secreting surface or membrane was very thick. It was not likely, therefore, that anything short of removal of the gland would effect a permanent cure.

This has been my experience with these cases, as I have said. But hemorrhage is sometimes great, and this has caused most authors to advise simply evacuation of the fluid, and injection or packing with iodine, or some other agent, to destroy the surface. It will be remembered that the gland is in close relation with the transverse perineal artery below, and with the bulb of the vestibule at its upper extremity. When, however, the organ is diseased and hypertrophied, the bloodvessels become greatly enlarged, as during pregnancy, making this locality much more vascular. Then the gland, as the result of its increased size, extends much further up, and becomes surrounded by the network of veins called the bulb of the vestibule, and there is closer contact with the vessels at the lower surface of the gland.

In pursuance of my original plan, I endeavored to separate the sac from its close attachments with the handle of the scalpel; but this I was unable to do, and I was compelled to dissect it out with the edge of the knife. The extent of surface was much greater than I had anticipated, even, and the hemorrhage very considerable; that from the arteries was controlled by ligation, but I found great difficulty in checking the venous. Hot water and compression failed, and I was finally compelled to pack the cavity with pledgets of cotton saturated with Monsel's iron, and supplement this with pressure supplied by vaginal tampon and with a compress held in position by means of a "T" bandage. The dressing was permitted to remain in position twenty-four hours (there being no untoward symptoms), when the bandage and compress were removed. I now ordered the constant application of lead-water and laudanum, which gave great comfort, as the parts were hot and somewhat swollen. Very little pain was complained of, however.

The next day a part of the packing was removed, and a little more each day after—as much as came away easily. Irrigation with carbolized water every four hours, and the constant application of the lead-water and laudanum, constituted the after-treatment. At the end of a week the last pledget of packing came away, and in another week the patient left the hospital, the



wound having almost entirely healed. I was much gratified with the rapid recovery, for I feared that there might be extensive sloughing and granulation.

The operation occurred some months ago. The patient is entirely cured.

In simple retention cysts I have succeeded in curing the case by incision and packing. In abscess of this gland, treatment of that kind will usually be sufficient. One word in regard to the cause of these cysts. In the present case I do not know the cause. A common cause is injury from coition or from childbirth, the former most commonly. It sometimes occurs as a result of the first coition. There is no doubt that some of the cases have a gonorrhœal origin, but I do not believe that this cause is as common as is often stated.

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## DISCUSSION.

DR. J. M. DA COSTA said: I remember distinctly two or three cases seen within a few months. In one case a large quantity of fluid was removed. Another case was of chronic inflammation in the left labium. I opened it and treated it in the ordinary way, but it rapidly returned. I then thought of dissecting it out, but fearing just what Dr. Baer met with, tried another method of treatment, which has succeeded well in some cases. After emptying the cyst, I took a curette and scraped the inside; then, with a swab, applied a strong preparation of iodine, consisting of pure iodine with iodide of potassium dissolved in glycerine. I next took two or three deep sutures, bringing the walls in close contact, and in that way succeeded in obliterating the whole sac.

DR. J. B. DEEVER said: With regard to the causation of these tumors of the vulvo-vaginal gland, my experience is not in accord with that of Dr. Baer. I have not found injury a common cause. The majority of cases which I have seen have apparently arisen without any special cause. I cannot understand the difficulty experienced in the arrest of hemorrhage. I should simply pack the sac, and stitch the edges of the wound over it.

DR. W. S. STEWART said: I have had some experience in operating on these cases. I do not use a general anæsthetic, but prefer to employ cocaine solution. I find that cocaine, in from a five to ten per cent. solution, has an astringent effect. In a case in which I employed this in the removal of one of these glands, I had expected hemorrhage, for the arteries in this location are numerous, and the veins valveless. During the removal of the gland I had no difficulty in controlling the bleeding by applications of the solution. After the operation, the use of sutures brought the surfaces accurately together, and there was no subsequent hemorrhage. In order to keep down inflammatory trouble, I made applications of phenol sodique.

DR. BAER said: The arrest of hemorrhage would not seem to be a difficult matter where the gland is of normal size, but when the organ

increases to a large size the vessels become much larger. If Dr. Deaver had seen the efforts which I made to check the hemorrhage by pressure, I think he would have agreed with me that it was difficult to control. I had feared that I might have a granulating surface and some sloughing. The wound, however, healed nicely, and I have not had a better result under the best antiseptic precautions. Cocaine would not have arrested the bleeding, for the hemorrhage did not come from the incision, but from the vessels beneath the tumor.

## PYOPNEUMOTHORAX OF NINE MONTHS' DURATION.

By JUDSON DALAND, M.D.

[Read June 22, 1887.]

THROUGH the kindness of Dr. Osler I am able to present this case to-night.

John L., æt. thirty-two, printer, single. Father died suddenly at age of thirty-six, cause unknown. Mother died at fifty-nine of valvular disease of the heart. An only brother, aged thirty-four, living and well. Two maternal aunts died of phthisis. No other case of phthisis in the family. As a child he was always weak and nervous; was never robust. He suffered from no special disease until the age of twenty-two, when he contracted syphilis. In 1880 he was operated upon for varicocele, and from that time until 1885 suffered from repeated attacks of articular rheumatism. About this time the removal of a corn from the ball of the left foot was followed by an abscess, which discharged a tablespoonful of pus daily for four months, and healing was not completed until six months later.

In the midst of apparent good health, his present trouble began abruptly in January, 1885, with huskiness of the voice; slight dry cough soon becoming frequent, and accompanied by mucous expectoration. Two weeks after the appearance of the cough he was awakened from sleep by a pulmonary hemorrhage, which continued more or less for a month, and then gradually decreased in frequency until July, 1885, since which time they have occurred only at long intervals. These attacks of hæmoptysis would vary in frequency from four daily to one in two weeks; and in amount, from one to eight ounces. During this time he continued at work, though he noticed that it excited renewed attacks of bleeding, as would also the act of stooping to the floor.

About October 17, 1885, he suddenly experienced severe pain in the right chest, with cough, high fever, and intense orthopnœa. The shortness of breath moderated, and the pain disappeared in two weeks, but he was confined to his bed for three months.

When admitted to the University Hospital, March 12, 1886, he was markedly emaciated, having lost twenty-two pounds during the previous eight months. The chest presented a remarkable prominence, composed chiefly of the second piece of the sternum and attached cartilages. Immediately below the prominence there is a deep depression. This deformity has nothing to do with his



present trouble, as it has existed from infancy. The apex beat is diffused, and can be plainly seen and felt in the seventh intercostal space in the mid-axillary line. Respirations are chiefly thoracic; expansion over upper part of right chest scarcely visible, and is absent at the base; over left base the expansion is increased. The thorax is long and narrow; intercostal spaces lessened; ribs more oblique, and in places overlapping; inferior costal angle acute. Vocal fremitus normal over left lung, diminished over right upper lobe, and abolished at base. Percussion note over right chest tympanitic down to the nipple, below which there is flatness. The recumbent position will lower the upper line of dulness four inches. All over the left lung the note on percussion is hyper-resonant. Auscultation of right chest shows well-marked metallic phenomena, namely, occasional metallic tinkling, amphoric breath sounds, amphoric echo of cough and voice, Hippocratic succussion splash, and bell tympany. All over the left lung a greatly exaggerated respiratory murmur can be heard. The liver is displaced downward, and the heart to the left. A musical systolic murmur can be distinctly heard all over the præcordia, and is carried to the left. Since then the heart has returned almost to its normal position, and the murmur has disappeared.

On the 21st of March, 1886, the dyspnœa became more marked, temperature  $101^{\circ}$  F., and severe pain referred to the depression in the lower part of the chest. The expectoration of eight ounces of blood seemed to give partial relief. The next day sixty-eight ounces of sero-pus were withdrawn by aspiration, with immediate relief to the breathing. In January, 1887, ten ounces more were removed, and in March an equal amount of pure pus was obtained. It required just one year for the sero-pus to become pure pus. Careful percussion immediately after the operation, and repeated again the following day, failed to show any lowering of the upper level of the dulness. After the last thoracentesis, about two weeks ago, when ten ounces of pus were again removed, it was noted that the upper level of the liquid fell one inch. A few hours later subcutaneous emphysema occurred around the puncture and spread over most of the right chest. This was due to the escape of gas from the pneumothorax.

Comparing his condition now with what it was fifteen months ago, it would seem that the dyspnœa is less, that the chest has retracted, that the amount of liquid is less, and that the rapid progress of the disease in the compressed lung has been checked; as shown by a comparative study of the physical signs, and from the fact that the heart and liver have returned almost to their normal position. The sputum is chiefly mucus or muco-purulent, small in amount, and contains a few bacilli.

From a careful study of the symptomatology and sputum, it would seem that this patient at first had phthisis of the right lung, and that ulceration into the pleural cavity occurred in October, 1886; this was followed by pneumothorax, which quickly became a hydropneumothorax, and he now has a pyopneumothorax with a pulmonary fistula.

The slowness of the change from serum to pus is very unusual, and the absence of hectic fever is probably due to an altered condition of the pleura, rendering it non-absorbent. The recurrence of subcutane-

ous emphysema after thoracentesis is rather uncommon, and the disappearance of the musical systolic murmur would seem to indicate that it was due to the displacement of the heart.

All authors upon this subject are of the opinion that in from sixty to eighty per cent. of all cases the cause of this condition is phthisis, and next in frequency stands emphysema. The other possible causes, such as gangrene, emphysema, rupture of subpleural abscess, are of such rare occurrence that they may be considered medical curiosities.

I beg leave to ask the following question:

In view of the probable phthisical condition of the compressed lung what would be the best treatment?

The patient referred to is in an adjoining room, where I shall be glad to demonstrate the physical signs to any one interested.

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## DISCUSSION.

DR. JAMES B. WALKER said: I have, in the Philadelphia Hospital, a case similar to the one reported, with the exception that the lung affected is the left. The patient came into the hospital last spring, suffering with phthisis of the left apex and with pleuritic effusion. With the aspirator, I removed a quantity of pure serum. After the aspiration, the patient developed pneumothorax. The patient was tapped a second time during the latter part of my term last year, and some purulent serum withdrawn. He left the hospital some time after this and went to the University Hospital, and pus was withdrawn by the aspirator. He recovered fairly his health and went out, and finally turned up at the Pennsylvania Hospital. There he was not tapped. He returned to my wards about one month ago with dulness on percussion over the lower portion of the chest, and other signs, as absence of respiratory murmur and of vocal fremitus, suggesting the presence of fluid. I tapped him, but found that there was nothing to withdraw, and evidently a plastic pleurisy alone existed. Although there was an advance in the disease at the left apex, the man had gained somewhat in flesh since last year. Had I found pus at the last tapping, I should have had a drainage tube inserted.

DR. WILLIAM H. PARRISH said: It might be interesting if I were to report a case of pyopneumothorax in a child seven years of age, which occurred three years ago. The case differed from those reported to-night, in that the affection was traumatic and occurred in a healthy child, of healthy parents. The child fell against the edge of a stove, producing some contusion of the chest, but not sufficient to give rise to anxiety on the part of the parents. Forty-eight hours later, pleurisy developed, and this subsequently passed into pleuro-pneumonia. So far as could be determined, there was no injury to the ribs. The symptoms became aggravated from day to day, and in the course of two weeks the rigors, high temperature, and physical signs suggested the existence of pus in the pleural cavity. Dr. John Keating saw the case with me, and we recommended opening of the cavity. The operation was deferred

on account of the objections of the parents. There was a rapid accumulation of pus which pushed the diaphragm downward and caused some bulging of the tissues between the ribs. Consent to the operation was then given. The child was not etherized on account of its exhausted condition, and during its struggles there was a gush of pus from the mouth. An opening was made, however, above the fifth rib, a drainage tube introduced, and brought out through an opening below the same rib. The cavity was washed out daily with a solution of carbolic acid, and in six weeks there was decided improvement. The child is now the picture of health, and the lung seems to expand as freely as on the other side. The fistulous opening between the pleural cavity and the bronchial tube closed in four weeks. The error in the treatment of this case consisted in not making the opening sooner. I think that free incision and drainage, with washing out of the cavity, contributed much to the final recovery. I should prefer these measures to the use of the aspirator.



## THE RELATION OF PYOSALPINX TO PUERPERAL FEVER.

BY J. M. BALDY, M.D.

[Read June 22, 1887.]

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UNTIL within a few years the term "Puerperal Fever" has been applied to certain conditions of the parturient woman without conveying any very definite idea as to the exact pathological lesion involved. As in microscopy we designate everything that we are unable to recognize by the general term "molecular débris," so in the parturient woman we have been in the habit of applying the meaningless term "puerperal fever" to a set of symptoms, the origin and source of which we knew not. As usual in such a condition of ignorance, an innumerable number of theories sprang up on the subject—the most widely accepted of which was probably that advocated by Fordyce Barker, viz., that it is a specific febrile disease.

Thanks to the zeal of bacteriologists, we have now conquered our ignorance and can state without hesitation or fear of successful contradiction that the disease under discussion is of undoubted septic origin. We are therefore justified in dropping the ambiguous term of the darker ages and applying terms more in accordance with our advanced knowledge of the pathological lesion. I have no intention of entering into an exhaustive discussion of all the phases of puerperal septicaemia, but shall briefly try to add something to our knowledge of the particular subdivision which, for want of a better name, I shall call puerperal pyosalpinx.

The belief that a certain proportion of our so-called puerperal fever cases are simply cases of salpingitis septica is by no means a new one, nor is it original with myself. Martin, in a recent investigation, has found the microörganisms of puerperal septicaemia in as many as seventy out of a series of two hundred and eighty-seven cases of inflammatory tubal trouble.

Schröder held that septic endometritis of the uterus did not ex-

tend to the tubes, *as a rule*; but he qualified this opinion by following it up closely with the remark that *occasionally* the endometritis did go on to a purulent salpingitis. Nor is Sanger silent on this subject, for he has only recently stated in a letter read before the Chicago Gynecological Society, in answer to one from Mr. Tait, "that salpingitis septica, coexisting with severe puerperal septicæmia, has never as yet given the surgeon an opportunity to remove the principal focus of disease by extirpation of the tubes. It is possible, however, that under certain circumstances such a procedure might be indicated." Even before these words of Sanger's were in print the opportunity to remove the principal focus, and, I may say, in this case the only focus, of disease, *had* occurred and been taken advantage of by the surgeon, as witness the following case:

Mamie P., twenty-three years of age, was delivered of a male child after a tedious but normal labor, some four years ago. She was at that time confined to her bed for eight weeks with "an inflammation in the stomach." She, however, made a good recovery, and has never suffered from a pain or ache in her abdomen since—she has, in fact, considered herself a typically healthy woman. On February 3d, last, I was called to attend her in her second labor. Although going with the messenger I found the labor over—a dead child together with the placenta, with all its membranes intact, lying between her thighs. Her bare arms, chest, and legs were exposed in a room without a fire. No examination was made, but she was put between warm, dry bed-clothes as quickly as possible. On the second or third day she had a chill, with a quick rise of pulse and temperature, and a tympanitic and tender abdomen. These symptoms abated somewhat, and I lost sight of her for several weeks. On the third of March, just one month from the date of her confinement, I was again summoned to her and found that she had been suffering ever since I had last seen her; she was at this time so emaciated that I hardly recognized her as my former patient. Her temperature was over 102°, her pulse over 130; she was having continued chills and creeps, hectic, night sweats, and sleepless nights; her abdomen was swollen and tympanitic, and intensely painful; her bowels were loose and fetid; micturition and defecation were both painful—she was evidently fast approaching death. An examination of the soft parts showed no signs of a recent tear; the uterus was subinvolved, and on the left side there was a large boggy mass, firmly adherent, tortuous, and extremely tender. The right side was tender, but no mass could be detected. Abdominal section was advised as the only remaining hope of saving life, and the proposition was eagerly accepted by both herself and friends.

Dr. Joseph Price saw the case with me and confirmed my opinion of immediate operation. I operated on the fifth of March (the delay being necessary in order to have her surroundings cleansed); Dr. Price, of Philadelphia, Dr. McMurtrie, of Danville, Ky., and Mr. Eckman, of Scranton, Pa., being present and assisting. The right tube and ovary were found healthy and were not removed. The left tube was found almost as large as the uterus

and firmly adherent in all directions, especially to the bowel, from which it was separated with the utmost difficulty. An abscess of the cellular tissue was ruptured while breaking up the adhesions, and pus welled up through the abdominal incision. Both tube and ovary were removed. A large cheesy mass on the bowel at the point of adhesion was trimmed down with scissors and an application of Monsel's solution made to the bleeding points. After a free irrigation a drainage tube was put in and the incision, which was only one and a half inches in length, was closed with three deep silk sutures.

On examination the tube was found to be distended with pus; the ovary was broken down and contained pus. The patient rallied quickly from the ether and had no shock. Her pulse fell to 80 and her temperature to almost normal within twelve hours, and remained so until about the seventh day, when the drainage tube was removed. Up to this time she had done as well as possible under the circumstances. There had been little or no pain, no catheter, bowels opened naturally; no drugs of any kind had been administered. The day after removal of the tube her pulse began to rise, as also did her temperature; pain developed in her left ovarian region, and she began to have hectic and cold ereeps. About the eleventh day there was a free gush of pus from the tube tract and she began to improve again from that moment. A rubber tube was inserted and passed deep into the pelvis and the abscess was washed out twice daily. The discharge gradually diminished and the tube was again removed. The wound is now completely healed and the patient is a well woman.

That these cases exist much more frequently than we have any idea is certain, and that oftentimes a life, otherwise doomed, can be saved by operative interference is but a natural conclusion. Mr. Tait mentions four deaths from this cause in Queen Charlotte's Hospital, as verified by post-mortem examinations, and says that "these cases during life were all regarded as puerperal fever." Säger comes forward with two cases which have come to his knowledge in which the overdistended tubes burst and discharged pus into the abdominal cavity, with death on the fourth day after confinement in one case, and on the twenty-first day in the second case. Who can doubt that, in the light of our present surgical knowledge, if these cases had been recognized and operated on, the women would have all survived? The day has passed, I hope, in which we will allow a woman to die of pus in her abdomen without at least proposing an abdominal section, not merely as a last resort, but as an early means of relief and safety. It is by no means to be held that because a parturient woman has an inflammation of her tubes, she is to be rashly submitted to the knife of the surgeon. I have, within the past few months, seen a woman who presented an elevated temperature, with anorexia, restless nights, and other general symptoms, and whose tubes, on examination, I found enlarged and painful. Under careful treatment this local trouble all



subsided, and with it the general symptoms disappeared and the patient made a satisfactory recovery. These mild cases, however, often go on to a chronic condition, when unrecognized and neglected, and the woman eventually falls into the surgeon's hands to be relieved of a pus-tube, and then generally gets the credit of having had a gonorrhœa at some period of her life, or else drags out a miserable existence until she dies of her trouble, or some other disease puts an end to her suffering. The following case fairly illustrates this :

Maggie F., thirty-one years old, married thirteen years, has had one miscarriage and five children. Had always had good health until her last confinement, six or seven years ago. At this time she had a slow and tedious "get up." Her physician told her that she had "an inflammation in her stomach." She was confined to bed for several months. She has never been well since that time; has been constantly losing flesh, suffered from pain, and has generally felt wretched, not able to work half the time. I was called to attend her on the 31st of March, last, and found her suffering with peritonitis, of which she had been getting gradually worse for the past three or four weeks. An examination disclosed a pyosalpinx firmly bound down and extremely tender. I made an abdominal incision and removed a large and densely adherent tube and ovary, both filled with pus, from the right side. Recovery was uninterrupted, and she has been relieved not only from her peritonitis but from all her old sufferings. The last time I saw her she told me she was feeling more and more like herself, and was fast regaining her former weight.

The only regret I have in either of these cases is that I did not remove both appendages. The case Mamie P., has recently had an inflammatory attack in the remaining tube, from which she has recovered, but I am afraid the time will come when another operation will be required. I think where pus is found that both sides should be removed always, whether one side is apparently healthy or not, the patient being willing, of course.

Whether or not this disease arises *de novo*, or, having already existed from other causes, has simply a new inflammation added by the puerperal condition, must be determined by careful investigation in each case. Hecker, as early as 1878, mentions two cases in which an old pyosalpinx was lit up by the puerperal state, and Säger adds another from his own practice in which the salpingitis had a prior existence. In the case of Mamie P., the patient was apparently perfectly well up to the time of her last confinement, but the adhesions were of such a firm character that it is safe to presume there was an old inflammatory trouble prior to this time. It is impossible to imagine the formation of such organized bands in so

short a space of time. At her first confinement she had "an inflammation in her stomach" and that was the probable beginning of her trouble. She undoubtedly has had tubal disease ever since (probably pyosalpinx) and has not suffered enough inconvenience from it to seek advice. This is often the history of these women; they complain of pain and general ill-health, loss of flesh, anorexia, and sleepless nights, etc., but oftentimes they do not even suspect the real origin of their trouble. The result in the case of this particular patient is a valuable lesson of the dangers of such a neglect, and is an additional reason why the disease should always be removed when recognized.

Of course, the possible contagion of gonorrhœa can never be eliminated excepting by a microscopical examination. In both my cases, although the trouble seemed very clearly to have arisen at the time of confinement, yet the chances of gonorrhœal infection both before and after pregnancy are not to be denied; however, in lieu of a microscopical examination, the chances are all in favor of a purely puerperal origin. But whatever the source, the results are the same, and it is only by prompt measures we may hope to save some of these cases. It is no longer surprising that even under the most careful antiseptic treatment of the uterus, vagina, and person of the patient as well as the person of the attendants that still patients are lost from septic poison. This disease has been recognized and operated on at least four times in Philadelphia; one case was operated on just two weeks previous to mine, by Dr. Longaker, in which a pyosalpinx was removed, the patient dying on the second day. I may state here that this operation was delayed three or four days after an abdominal section had been urged. Dr. Joseph Price has since operated twice, and in one case found more than a quart of pus in the abdominal cavity; the case, unfortunately, came into his hands too late and the patient survived only two days.

These cases, though few in number, certainly teach us that the work done in this direction is encouraging, and although a large percentage of the patients have died, it only warns us of the extreme importance of an early diagnosis and prompt surgical interference. It becomes our imperative duty in every case of post-puerperal trouble to make a thorough investigation on the appearance of the first symptoms, and should a fulness be found on either or both sides of the uterus, accompanied with pain on touch and with constitutional symptoms of gravity, there should be no hesitation as to the course to pursue. This being secured, our present high mortality of one woman

out of every hundred delivered in large cities, as recently stated in a statistical paper on lying-in charities in the United States, must be very largely diminished and the fatal results now surrounding our parturient women must become infinitely less.

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## DISCUSSION.

DR. B. C. HIRST said: Purulent salpingitis must be an infrequent cause of puerperal fever. In the clinic at Dresden, between the years 1872 and 1878, there was only one such case found out of eighty-two post-mortem examinations of puerperal women, and there it was doubtful whether the purulent salpingitis was primary or secondary. There was a beginning pleuritis and a beginning metastatic abscess in the spleen. That fact would have to be taken into consideration, whether there might not be a metastatic condition, and whether operation would not hasten the fatal termination. It is not well to lay down the absolute rule, that where pus is found on one side of the uterus abdominal section should be performed.

DR. D. LONGAKER said: With certain portions of the paper read, I am in sympathy, but I should be loath to accept the opinion that a large proportion, or even that a small proportion of the cases of puerperal fever originate from diseased appendages. That diseased appendages are the cause of puerperal fever, except in a very small percentage of cases, I do not believe. The recommendation that both ovaries should be removed, is but an echo of the statement of Tait. To carry the argument a little further, would lead us to conclude that there was some disease of the opposite side. It is pretty definitely known that the spermatozoa travel through the Fallopian tubes and lodge in the ampulla. This would be impossible in a tube distended with pus, or in a condition of catarrhal inflammation. That gonorrhœa should cause a disease of the appendages after conception has occurred, without causing abortion, is extremely improbable. I believe that in some of the cases where, on section, we find diseased tubes filled with pus, the condition of the tubes may be looked upon as the result of the puerperal fever, and not as the primary condition.

Where we find a patient in a low condition, or in a moribund condition, I believe that it is a mistake to attempt the removal of the tubes. I believe that the chances of recovery would be greater if a simple incision were made, and the pus carefully washed out, a drainage tube inserted, and the wound closed. We know from the statement of Martin, that many of these cases recover without operation. Martin found operation necessary in only one-fourth of his cases.

DR. W. H. PARRISH said: I think that Dr. Baldy has drawn the rule too absolutely in recommending that where there is a mass to one side of the uterus with grave symptoms, operation should be performed. All have seen patients who presented these conditions, and have gotten perfectly well, and remained so. I would agree with him if the symptoms were such as to enable us to



determine that the pus was within the tubes. In such a case removal of one or both tubes would be indicated, but I agree with some who have stated that pus within the tubes is an exceedingly rare occurrence in puerperal fever. When it does exist, I think that, as has been pointed out, it will be associated with the presence of pus in other parts of the body, or with such a degree of blood poisoning that the mere removal of the tube would not materially favor the recovery of the patient, but would rather tend to induce a fatal result.

With reference to the presence of pus in the peritoneal cavity, in cases of puerperal fever, I will say that I have seen some forty or fifty autopsies in women dying of puerperal poisoning. The quantity of pus in the peritoneal cavity has been limited even where it was supposed that there was extensive peritonitis. I think that the formation of pus is one of the later results of the puerperal poison. We may have it in the lymphatics and veins without it being present in the peritoneal cavity. The time has not arrived when we can apply any absolute rule to these cases. To operate where an operation was not indicated, would probably contribute to the fatal result.

DR. BALDY said: When pus is present in the abdomen, whether in the tubes or elsewhere, we should not hesitate to apply the general surgical principles which we apply to other parts of the body. The danger of evacuating pus from the abdominal cavity has been reduced so low that it need not be considered an element of danger sufficient to contraindicate operation. It may be that where there is pus in the Fallopian tubes, that this is only one of many metastatic abscesses, as stated by Dr. Hirst; but in the case which I have reported, it was the only focus. In the four cases reported by Tait, there was no pus in any other portion of the body. This is also true of all other cases referred to in my paper. It is also true that Martin, in his series of 287 cases, removed the tube in only one-fourth of the number; but he does not say that in all these cases there was pus. In a great many cases where we expect to find pus, we find the tubes enlarged and adherent, but containing nothing.

With regard to the removal of both tubes, where there is pus in one, Tait has reported twenty-six or twenty-seven cases of unilateral removal of tubes—comprising his entire experience in unilateral removal over the space of several years. He has regretted in every case that he did not remove both tubes. In a certain number of the cases, the disease has returned, in another portion the patients have died suddenly, with a history of abdominal inflammation, and another portion have symptoms of trouble appearing in the remaining tube, which will shortly demand operative interference. Dr. Price has had a case in which he removed one appendage, and at the time the other appeared to be perfectly healthy. Within two months he attempted to remove the remaining tube, and was unable to do so on account of the adhesions. One of my own cases has, within two months after operation, been confined to her bed with an inflammatory attack in the remaining tube.

## SPECIMENS EXHIBITED.

DR. B. F. BAER exhibited a fibroid tumor of the uterus, and made some remarks relative to

### HEMORRHAGE AT THE MENOPAUSE.

This tumor was removed yesterday from a lady aged forty-two years. About a year ago she began to lose more than the normal amount at her periods. Soon after, she suffered from attacks of metrorrhagia twice a month, sometimes almost to syncope. At times she would flow continuously for two weeks. Finally, in the intervals, she began to have a fetid, watery discharge. She was pale, emaciated, and cachectic.

Now, such a history often indicates the presence of cancer, but not always. It *never* means that the patient is simply near the menopause. A great deal of harm has been caused by that idea. In this case the physician thought that the hemorrhage was due to the menopause, and did not consider it necessary to make an examination. But finally the patient insisted upon it, in order to find out if there were not a local cause. He then made an examination, and diagnosed the case correctly. I saw the case in consultation, and removed this fibroid tumor, which is ulcerated at the base, and hence its fetid discharge.

I have known many instances where patients have been put off by the statement that the hemorrhage was due to the change of life, and almost bled to death from a pathological cause. Several years ago I reported a marked case of this kind, which was easily cured by the removal of a small polypus from the neck of the womb.<sup>1</sup> At first the hemorrhage was said to be menopausal. After a time the patient became cachectic, and the case was pronounced to be one of cancer. As cancer is properly regarded as incurable, it was considered unnecessary to submit the patient to an examination. This patient was cured by the removal of a fibroid polypus! I have actually known a patient to die from repeated hemorrhages caused by a benign disease, where the bleeding was at first attributed to the menopause, and, finally, to cancer. I believe that great harm is often done by physicians putting patients off with the statement that the hemorrhage at this period of life is the result of the change of life, instead of seeking for the real cause.

DR. G. B. DUNMIRE said: In this connection I would refer to the case of a patient of mine which nearly resulted seriously from my reluctance to examine unmarried ladies. The examination was put off until at last I was compelled to make it, because of the frequent and continuous menorrhagic attacks and the anæmic condition of the patient. I found a small vascular polypus, which was removed, and the patient recovered.

<sup>1</sup> The Significance of Metrorrhagia, etc. Amer. Journ. of Obstetrics, vol. xvii. No. 5, 1884.

## CIRRHOSSED AND CYSTIC OVARIES.

DR. J. M. BALDY exhibited some specimens of cirrhomosed and cystic ovaries, removed from Mrs. S., under the care of Dr. Wolfe, of Skipphaek, Pa. The patient married four years ago, at which time she was in perfect health. Shortly after marriage she had a miscarriage; since then there have been several. Since the first miscarriage, she has suffered pain constantly, and the menses have been profuse. Dr. Wolfe recognized a tender mass posterior to the uterus. I found, on examination, what was evidently a prolapsed ovary, enlarged, adherent, and very tender. She bled for three days after the examination, and suffered great pain, as she had always done before under examination. I removed both ovaries last Thursday. Since the operation, the patient has been doing well. To-day, the sixth day, her temperature is 99.8°, and her pulse is 72.



## SIMPLE FRACTURE OF THE DISTAL PHALANX OF THE INDEX FINGER.

By A. C. W. BEECHER, M.D.

[Read September 14, 1887.]

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THIS apparently trifling accident is so infrequent that until three years ago I had never seen a case either in hospital or private practice, and then it occurred in the person of my father. While upon a balcony, desiring to re-enter the room from which he had emerged, he raised the window-sash, and by neglect the point of the index-finger was caught between the muntin of the lower sash and the frame of the upper one, causing intense pain and almost producing a faint. Upon examination of the injured part, he found no ecchymosis under the nail, but feared that the injury was such as to cause its loss. Pain continued for some time, particularly when pressure was made upon the point and palmar surface of the finger; this was attributed to the bruise. After some days, my attention was particularly called to the finger by the statement that, by pressing upon the point of the finger and attempting motion, there seemed to be a roughness and motion which did not belong to the joint. An examination confirmed this, and showed that there existed a transverse fracture of the shaft of the phalanx.

My father's business requiring considerable use of the member, I was for a moment puzzled as to a dressing to be efficient and at the same time neat and not bulky.

I applied a narrow bandage from the end of the finger to the second phalangeal joint, making two layers; this I then coated thickly with collodion, which was of a syrupy consistence, the result of the slow evaporation of the ether. Drying and hardening quickly, this made a neat, smooth, and stiff waterproof casing, which was worn with but one change until the fracture was cured.

For a neat, clean, and efficient dressing in the simple fractures of the distal and second phalanges I cannot imagine a form superior to this, though the solution of the sodium silicate or gutta-percha would answer as well as the collodion.

The usual care in not making the bandage too tight before applying the solution must not be overlooked here.

Fractures of the phalanges are usually the result of direct violence, often very great, producing compound fractures and requiring amputation, and for this reason simple fractures receive but little notice in the various works on surgery.

## DISCUSSION.

DR. A. B. HIRSH said: Some three years since, a gentleman came to my office for an injury to the distal phalanx of his right index-finger; he had within the previous half-hour caught it in closing the safe-door. Crepitus showed a simple fracture, and I applied a light dressing, similar to the one described by Dr. Beecher, but the exact material I do not now remember. The patient spoke of how conveniently small and light the "splint" seemed—in fact, it scarcely interfered with his bookkeeping. There was *no deformity*.

## SOME MORBID CONDITIONS OF THE URINE.

BY F. W. PAVY, M.D., F.R.S.,  
SENIOR PHYSICIAN TO GUY'S HOSPITAL, LONDON.

[Remarks made September 19, 1887.]

I MUST first of all express the honor I feel in being invited to meet with you this evening, and next to apologize for impairment of voice due to cold, and for being under the influence of fatigue from travel.

I am before you to say a few words upon certain morbid conditions of the urine, and my hope is that we may compare notes of observations in the Old World with observations in the New World. I shall first of all refer to albumen. Albumen in the urine with us was formerly regarded as a matter of the most serious import, but we are now beginning to recognize that a certain amount of albumen in the urine is not always of grave import. My own practice lies very largely with urinary diseases, and patients coming under my care always have the urine examined by an analyst; and I am frequently meeting with a certain amount of albumen in the urine, without its presence being attended with anything that would lead me to suspect that a grave condition exists. In association with diabetes, it is not at all uncommon to find, when the patient first comes under observation, a certain amount of albumen in the urine; but when the patient is put under treatment for the diabetes, it is not infrequently found that the albumen disappears in the course of a few weeks. In these cases of albumen in the urine, we must look to the general condition of the patient to see whether or not there are other indications of the existence of grave renal disease.

There is another condition which I presume has been brought before the profession in America, in which albumen exists at a certain time of the day, and not at others. I have suggested for this condition the term *cyclic albuminuria*. I have studied these cases for some years past, and I should think that they occur in this country as well as in the Old World. I know that they occur in Germany, for the matter



has been taken up there and followed out. This condition is observed in persons who are excitable and of a nervous disposition, and as a rule in young persons, although I have met with some cases in the middle-aged. The albumen is to be met with at one time of the day and not at others. These cases are recognized, as it were, only by accident. Sometimes the urine is examined on account of some pain in the loins, but most frequently these cases are discovered through examinations for life insurance purposes, or for some branch of the civil service, as is required by the Bank of England. So long as the individual maintains the recumbent posture, no albumen will be detected, but in one and a half or two hours after rising the maximum quantity of albumen will be found. As a rule, the quantity of albumen declines toward evening, and on going to bed it has entirely disappeared. Sometimes a trace of albumen is to be found in the afternoon and evening, but the first urine passed on rising in the morning contains no albumen whatever. These cases seem to be of no serious import. I suppose that the presence of albumen depends on the condition of the vessels. I suppose so, but certain it is that these cases are not associated with any constitutional condition. I now come across quite a large number of them.

I shall next refer to *sugar in the urine*. This is another morbid element which has varying degrees of importance. In young persons it is of the gravest import, while in elderly persons it is not so serious. In early life I have known cases to go on for years, but this is the exception; the usual duration is about two years. Ultimately they all terminate unsatisfactorily. After the middle period of life, however, sugar in the urine has a very different significance. In young subjects we have a disease which seems to be of a progressive nature. Notwithstanding whatever we may do for it, there is something which insidiously progresses in the system and leads ultimately to a fatal termination. But after the middle period of life a good deal depends upon the patient himself. Under proper management the disease may, as a rule, be held under control and the patient live for years in a satisfactory condition, but to accomplish this, rigid measures of treatment must be carried out.

One may express in a very few words, and without advocating any idea or theory, the precise nature of *diabetes mellitus*, or sugar in the urine. I should speak of it as a defective or faulty assimilative action—a faulty chemistry. The elements of the food which we take undergo chemical change in the system, by which they are rendered useful. A certain group of principles entering largely into the composition of our

food, are the carbohydrates. These principles in diabetes do not undergo their proper chemical change and thus become eliminated from the system. What do we observe in a state of health? A person takes one of the carbohydrate group, it makes no difference which—starch, grape sugar, cane sugar, dextrine, or sugar of milk—they all behave alike in the system, and it is so changed as to be rendered subservient to the requirements of the system. In a state of health, we see nothing more of them. Not so in diabetes. In the diabetic these carbohydrates are no longer consumed. There is a faulty disposal of them. Received into the alimentary canal and afterward absorbed, they do not undergo their proper transformation, but pass off from the system in the form of sugar in the urine; so that I say, looking at these two conditions, a condition of health and a condition of diabetes, we may describe diabetes as a faulty disposal—a faulty transformation or assimilation of the carbohydrate elements of our food. In diabetes, in proportion as these carbohydrates are taken, so will be the amount of sugar in the urine. This I can say without any hesitation whatever.

In order to follow a case of diabetes satisfactorily, I consider that a quantitative examination of the urine should be made, and, for myself, I feel quite in the dark as to the progress of a case unless I have this quantitative examination. In my own practice, I keep an analyst who examines the urine of patients—a night and morning specimen—and directly I get the analytical report, I can read off exactly the condition that I have to deal with. Without this, I should be perfectly in the dark as regards the progress or the severity of the case. It does not do to rely on the specific gravity. I have met with a specific gravity of 1.040, without any sugar in the urine. Medical men are often concerned over the specific gravity of the urine. The patient may have been put under treatment, but still the specific gravity keeps up to 1.032 or 1.035, although the urine is free from sugar. Under these circumstances, I say to the medical practitioner, Do not concern yourself with the specific gravity. If the urine is free from sugar, the high specific gravity is a favorable sign, as showing that the kidneys are equal to good work. If the kidneys were diseased, there would be a low specific gravity. The high specific gravity may be kept up by the passage of only a limited quantity of water, and by the nitrogenous diet which the patient is taking, adding to the elimination of urea. On the other hand, a low specific gravity may sometimes be met with where there is a considerable quantity of sugar in the urine. I have met with a specific gravity of 1.009 or 1.010,

and yet the urine contained a considerable quantity of sugar. These have been mixed cases of diabetes insipidus and diabetes mellitus. They are proven to be mixed cases by the fact that when the patient is put under proper dietetic treatment, the sugar disappears, but the quantity of urine keeps up. I myself do not attach so much importance to the specific gravity as is done by certain medical men.

In testing the urine for sugar, my opinion is that the copper test is by far the best. As we all know, Fehling's solution is the test generally employed, but there is this disadvantage about the Fehling's solution, it does not keep well; after being kept some time, it throws down a precipitate without the presence of sugar. This had led to many mistakes in diagnosis. I have frequently had patients sent to me with the statement that they were suffering with diabetes mellitus, when the only trouble was that a faulty Fehling's solution had been employed. Some years ago, I directed my attention to the question whether or not the ingredients of the Fehling's test could not be put together in the form of a pellet, and the solution be made as required. Certain difficulties were experienced at the outset, but these have been overcome. The pellets, as now made, consist of sulphate of copper in the anhydrous form, Rochelle salt, and potash. It is necessary to separate the sulphate of copper from the potash. This is done by first putting in the die the sulphate of copper, then a little Rochelle salt, next the potash, and, finally, more Rochelle salt. The pellet, after being made, is surrounded with waxed paper and kept in a well-stoppered bottle. If properly prepared and handled with care, the cork not being left out of the bottle, these pellets will keep indefinitely. There is this advantage about the pellet—it will never deceive you, for if it is allowed to absorb moisture, it at once becomes unfit for use, the oxide of copper being thrown down in the form of a black precipitate.

In the treatment of diabetes, I attach the greatest importance to diet. I do not consider that you can get on with the management of these cases unless you exclude as far as possible those principles of which there is a faulty assimilation. If sugar appears in the urine, it must previously have existed in the blood. I know from frequent examinations that the blood contains a trace of sugar, which may be represented in figures as from 0.5 to 0.8 part per 1000. In harmony with this condition of the blood, there has been a trace of sugar in the urine.

The ammonio-cupric test is the one I employ as a quantitative test. It consists of Fehling's solution with the addition of ammonia. With



the Fehling's solution there is, on the addition of saccharine urine, a precipitate of the suboxide of copper, and, for quantitative purposes, this precipitate interferes with the determination of the exact time when complete reduction has taken place. While the presence of ammonia does not interfere with the reduction, it keeps the reduced suboxide in solution, and we get the decoloration without the formation of any precipitate whatever. The addition of ammonia gives a more intense blue color to the Fehling's solution, and this is brought by the reduction to the color of water without the formation of any precipitate. With the apparatus in perfect order, the quantitative determination can be made in two or three minutes. This test is so delicate that ordinarily, to perform it satisfactorily, you have to dilute the urine 1 : 20, and where it contains much sugar, 1 : 40. I usually determine the proportion of sugar per thousand of urine, but if it is desired to determine the number of grains per ounce, this can be done by multiplying the quantity per thousand by 0.4375.

In examining the urine of a diabetic, I generally desire that a night and a morning specimen be brought. When a person lives as people ordinarily live in England—that is to say, taking a meal on rising in the morning, breakfast; a meal in the middle of the day, lunch; and a meal in the early part of the evening, dinner—the urine passed on going to bed contains considerably more sugar than the urine passed in the morning. Where a person dines in the middle of the day and sups shortly before going to bed, then the conditions are reversed—there is less sugar in the night water than in the morning water. Over and over again, by the quantitative examination of the urine, I have detected errors of diet where the patients have had the greatest desire to keep to what was right. A person who has been passing only a little sugar, brings a specimen which contains a large quantity of sugar. Under such circumstances we must look for some error in the preceding meal. In one case this proved to be blane-mange which had been made with corn flour. Blane-mange for the diabetic should be made with cream and gelatine or isinglass. In another case a patient had been passing very little sugar, when suddenly the quantity increased. Careful questioning revealed no error in diet, until it was learned that the patient had substituted for the bran biscuits which he had been using others said to be “just as good,” which examination showed to be made of the whole meal. I refer to these cases to show the value of the quantitative analysis.

In the treatment of these cases, the exclusion of the carbohydrate elements of the food should be as complete as possible. In the case

of a person in the middle period of life, I first put the patient upon a strict diet. Very often the sugar for a time lingers in the urine. It is materially diminished, but has not disappeared. I may also say that I have, in addition, recourse to opium, codeia, or morphia, for I believe that these drugs have an important influence in controlling the disease—or, to put it in other words, they restore the assimilative power. Certain it is that under the influence of these drugs and strict diet, sugar after a time disappears from the urine; and after the urine is kept free from sugar for a few months, I find that the individual has a certain amount of assimilative power over the starch of bread. I test this by giving him a couple of ounces of bread. Frequently there is no reappearance of sugar. If there is no return after this has been continued two or three weeks, I increase the quantity to three ounces per diem. Then, if there is no return, to four and one-half ounces; and, finally, to six ounces. Then the person is in the position of a small bread eater. I recommend patients to be content with that. They can very well give up potatoes and sugar, but to give up bread is a serious matter with many people. When a person can take six ounces of bread per diem, he is not in an unfavorable condition. Many of these persons can continue to take this quantity of bread with no return of sugar in the urine. If, however, they go further and resume their ordinary diet, there will be a reappearance of sugar. The urine must be taken as the guide. Treating the case in this way, my experience is that, after the middle period of life, these patients do exceedingly well.

I must apologize, Mr. President, for the crudeness of these remarks, for I have had no time for preparation. I thank you most heartily for the attention which you have given to me. I cannot close without thanking you and your countrymen for the cordial reception given to myself and my confrères by everyone with whom we have come in contact.

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## DISCUSSION.

DR. JAMES TYSON said: It is needless to say how much indebted we all feel to Dr. Pavy for his remarks, and in the brief time allowed for discussion I desire first to say that I think we, in America, have passed through much the same transition in our views as to the import of albumen in the urine as has taken place in England. The fact is thoroughly recognized that albumen may be present without any serious import; but the explanation of these curious albuminurias is still unsatisfactory. There are a certain number of

them which are clearly the result of diet, and may be called alimentary albuminurias, but that all cases cannot be thus explained is shown not only by the cases alluded to by Dr. Pavy, but also in such as those where the urine on rising is free from albumen, but in which within an hour afterward the urine passed is albuminous, although no breakfast has been taken.

The crucial test for the determination of the gravity of an albuminuria is the presence or absence of casts. I have found that in these harmless albuminurias tube casts are invariably absent; and where there is a constant association of albumen and tube casts, it, of course, means renal disease, no matter how slight the general symptoms may be.

With reference to sugar, we also entertain much the same views. In my hands Fehling's solution has proven the most satisfactory test, although open to the disadvantages alluded to by Dr. Pavy. Much, however, may be done to preserve it; if the bottle is kept corked and in a dark place, the solution will keep for a much longer time. I have also obtained satisfactory results in this respect from a Fehling's solution in which mannite was substituted for the tartrate of potassium and sodium. I have found that the pellets made in this country rapidly spoil.

In reference to the treatment, we largely agree. I am inclined to believe that certain sugars, and especially certain fruit sugars, are better managed by the diabetic than are others. Thus, I think that a patient may eat an apple, or even an orange, without much disadvantage, whereas the use of grapes is always attended with an increase in the quantity of sugar. The same is true of milk sugar. I am satisfied that milk is a good diet for most diabetics, although, of course, it is not a cure. The dietetic treatment is, for the most, efficient; but, so far as my experience with drugs goes, I am satisfied also that the preparations of opium, and especially codeine, are the most efficient adjuncts to the dietetic treatment. They are, however, open to the objection that they produce constipation, which almost always aggravates the other symptoms of diabetes.

DR. J. W. HOLLAND said: The remarks of the previous speaker have reminded me of my experience with glycerine as an organic medium in Fehling's solution. This makes a solution which keeps for a considerable time, although not indefinitely. At the Jefferson College laboratory we employ two solutions of definite strength, one containing the sulphate of copper, and the other Rochelle salt and the caustic potash or soda. These are mixed in equal quantities when it is desired to employ the test.

In the use of Dr. Pavy's quantitative test, I find one small objection—which can be obviated by extreme care—that is, if the solution is boiled in an ordinary capsule the ammonia will be driven off and reoxidation of the copper follows. If a flask is employed the ammonia will not escape so rapidly.

One form of pellet lately brought to my attention is the indigo-carmin pellet. This seems to keep indefinitely. It is composed of sodium carbonate and the sulphindigotate of sodium. It is a very sensitive test—even more sensitive than the Fehling's solution.

DR. KLEEN, of Karlsbad, was introduced, and said: I had, two years ago, under my care at Karlsbad, a most singular case. Mm. X., of Gothenburg, fifty years old, then consulted me, telling me that she was suffering with diabetes, that the illness had accidentally been discovered the year before,



and that she had then visited Karlsbad (1884) and consulted Professor Seegen (who since that time had retired from practice).

Mm. X., when I saw her, presented no symptoms of diabetes or of any other illness, except some nervous debility. I gave her a considerable quantity (100 grammes) of cane sugar, collected the urine for some hours, and afterward for twenty-four hours, but found no glucose in it. I did not succeed better after she had dined copiously on rice and other amylaceous food. I then pronounced her free from diabetes. I still kept the case under observation, however, and at last found, upon examining the urine two hours after a meal, which had ended with a large portion of sweet fruits (mostly pears), a small quantity of reducing substance. Both Fehling's and Nylander's (bismuth) solutions showed reactions corresponding to the one we got, with urine containing 0.1–0.2 per cent. of glucose. When testing the urine with polarization by the spectroscope, I found, to my utter surprise, a slight deviation *to the left*. The urine did not contain a trace of albumen. I was at a loss what to think of it, and submitted it to the test of fermentation. The same day, however, I received a letter from Professor Seegen, stating that when the patient was under his care, her urine had contained much larger quantities (as much as 3 per cent.) of reducing substance, and that he had found that substance to be *levulose*. At the same time, Professor Seegen sent me a supply of glucose, asking me to submit the patient to a test of her toleration of that substance. So I did, and found that portions of 100 grammes or more did not produce more than very small quantities of reducing substance in the urine—that substance, to judge from a very slight deviation to the left in a good instrument, being levulose.

Worm-Müller has proved that glucose, administered in large doses, passes to a certain (small) portion unchanged into the urine, even in healthy persons, while it passes to a much larger proportion into the urine of the diabetic patient. He has also found that all the different species of sugar, administered in large doses, in a certain (small) proportion pass *unchanged* into the urine even of healthy persons, while in the diabetic patient at least some portion of them passes into the urine *transformed into glucose*. He believes in this latter circumstance to have found a difference, also, between persons suffering from real diabetes and those whose urine, while under ordinary diet with the common reagents, presents traces of glucose, or only now and then, under peculiar circumstances and in a passing manner, contains somewhat larger quantities of it.

This coincides with my own experience so far as it hitherto goes. Like all physicians who occupy themselves with researches in this direction, I find every year persons whose urine shows traces of sugar, and now and then—especially after strong emotions, after alcoholic excesses, or after very rich meals of mixed food (but, generally, not after meals *exclusively* consisting of amylacea or of cane sugar)—in a passing manner, somewhat greater quantities of a substance which shows *all* the qualities of glucose. In these doubtful cases, I usually give a large quantity of cane sugar; and afterward often find no glucose—or only slight traces of it—in the urine, till I have boiled it with mineral acid, and thus converted a portion of the cane sugar that has passed over into glucose, whereupon I will find the well-known reaction of glucose. I consider these cases to be distinct from true diabetes, though it seems to me

highly probable that they indicate a tendency to that disease, which others of larger experience than myself have also noticed—for instance, Professor Frerichs.

In the present remarkable case of levulosuria, I found that some portion of cane sugar passed unchanged into the urine. It seemed to me to be of great interest to find out how Mm. X. reacted against the other species of sugar, especially against levulose, which, with some reason, could be expected to pass over in larger proportion than in quite normal persons. I therefore had the wish to administer a large amount of honey (which is a mixture of glucose and levulose), and also to make a test with milk sugar; but Mm. X., who had heard that she should avoid sugar above all things, and who had an interest in her own case, only partly of the same nature as my own, did not wish to be submitted to further experiments, especially as I could not promise that they would be without some momentary influence on the urine. I can, therefore, only give the above description of the case, such as is already given by Professor Seegen, who first discovered it, but I am not without hope of being able in the future to give fuller information upon it.

I am decidedly of the opinion that the case is not, clinically speaking, strictly one of diabetes. If the substance had been glucose, it would have ranged among the large number of the above-named glucosurias, continuing unchanged for a great number of years in healthy or nearly healthy persons. I was rather astonished at seeing Professor Seegen state that the urine once contained as much as three per cent. of levulose, but cannot doubt the accuracy of this most excellent observer. That the quantity has diminished so very much without any dietetic treatment, makes the case even more interesting than it otherwise would be. I allowed Mm. X. a tolerably good supply of starchy food, advised her only to avoid excessive use of them, and I have lately heard that the urine only now and then contains small quantities of reducing substance.

## AN UNRECOGNIZED CAUSE OF SOME THROAT AILMENTS.

BY LENNOX BROWNE, F.R.C.S. ED.,

SENIOR SURGEON TO THE CENTRAL LONDON THROAT AND EAR HOSPITAL.

[Read September 19, 1887.]

IN accepting the very flattering invitation of your President, Dr Solis Cohen, to speak a few words to the members of the Philadelphia County Medical Society, it appeared to me both more becoming and more profitable to offer you some practical remarks explaining the *rationale* of some of the commoner of throat ailments, then to attempt to magnify the office of the laryngoscope by the relation of rare or wonderful cases. I was the more inclined to this view because I was well aware that, through the assiduous industry and well-known skill of your President and other members of your Society, you have for some years been kept thoroughly posted in all that is new in laryngology.

It is now some ten years since first I sought an objective explanation of the condition known as *globus hystericus*, and since I commenced to make a systematic examination with the laryngoscope of every patient who came to me with this symptom. The result was communicated in a paper to the Congress of Laryngologists held at Milan in 1880. I found that but very few cases indeed are of a hysterical character—that is, of the nature of a phantom sensation—though uterine or ovarian disorder is a not infrequent predisponent, or, at least, concomitant of the throat condition in the female sex.

Extending the term *globus hystericus*, I find that, with hardly an exception, all and every other subjective sensation in the throat is symptomatic of an objective cause. The chief of such feelings are those of a heat, a prickling, a swelling, a weight, a straw, a hair, or other foreign body. A few patients—one especially, a hale farmer—have complained of a feeling of intense cold, which is sometimes relieved, sometimes aggravated, after food-taking. In some instances there is actual pain with spasm, cramp, and a sensation of choking, and



not infrequently there is cough; this last symptom varies in degree from a slight hacking, to the loud hyena-like bark known as nervous laryngeal cough. Many of the cases of so-called laryngeal vertigo, or, as I prefer to call it, of laryngeal epileptiform seizures, are capable of explanation, and cure, on the lines I am at present taking.

On examination of the throat of a patient with symptoms such as I have described, one may or may not see chronic congestion and relaxation of the fauces and uvula, enlargement of the tonsils or obstruction by caseated material of the orifices of the crypts, granular pharyngitis, or even laryngeal hyperæmia. Where any one of these conditions is present, treatment thereof may or may not give relief; but none of them represents the class to which I would draw your attention, namely, that in which there is no generally recognized morbid state of local significance.

The results of laryngoscopic investigations in my hands have shown that there is:

1. A varicose, and even truly hemorrhoidal, condition of the veins at the base of the dorsum of the tongue, sometimes at the under surface and sides, in which last case it may be symptomatic of mitral insufficiency, or of severe hepatic derangement, or even of cerebral lesion. There is often a similar varicose state of the vessels in the superior surface of the epiglottis.

2. An enlargement of the circumvallate papillæ at the back of the tongue, causing the epiglottis to be hindered in its movements—imprisoned, as your President first called it. Just drawing attention to the fact that the structure of these glands is very similar to that of the tonsils, I may mention that in a few instances I have seen actual blocking of the orifices, similar to the condition known generally as chronic follicular tonsillitis. I may also note that it is not possible to see these things either with a tongue depressor or in the laryngeal mirror as ordinarily employed. Many observers, especially beginners, seem to consider that their sole aim is to see the vocal cords, and, if these are sound, they write down, "larynx normal"; but they omit to look well to the frame-work. To see this condition of lingual varix and glandular hypertrophy, the mirror must be placed quite high up in the throat.

3. Where, as is often the case, there is no actual or noticeable enlargement of the thyroid gland, it will be observed, on passing the hand gently over the front of the throat, that there is a distinct fulness of the thyroid isthmus. If the least pressure be made at this situation, the patient—not necessarily a female—will complain that the abnormal

sensation is at once excited, and, on being questioned, will admit that when it occurs the collar is felt to be too tight for the neck.

Inquiring into the general health, and happily failing to find any of the more serious lesions to which I have alluded, it will be noted that habitual constipation and a generally defective circulation are both frequent symptoms; while in others there will be concomitant evidences of a varicose diathesis, as rectal hemorrhoids, varicocele, or varicose veins of the extremities.

In females the menstrual flow is often morbidly frequent or excessive, and there are other evidences of an enfeebled vasomotor control. Abuse of alcohol and tobacco are excitants of the condition; and in the cases of singers or public speakers, defective methods of filling the lungs—forcing the lower registers upward, or other functional fault which may lead to undue strain on the palato-pharyngeal muscles and engorgement of the vessels in this region—are fruitful predisponents.

In this connection, I may refer to the accurate explanation offered by your fellow-citizen, Dr. Carl Seiler, of the etiology and pathology of chronic pharyngitis when occurring to voice users.

Some of those obscure cases which come under our occasional notice, of the presence of small quantities of blood in the mouth, or of the taste thereof on rising from sleep, will be explained by the leakage of one or other of these enlarged and hemorrhoidal venous capillaries in the region now under consideration.

A few words as to treatment. If the case is not of long standing or of aggravated character, correction of the main constitutional cause—cessation of the faulty method of voice production, or prohibition of a vicious habit or indulgence—may be sufficient to effect a cure, but this is rarely the case. Of remedies, I give chalybeates and aperients with digitalis or ergot, as may be indicated. Locally, astringent applications, especially of chloride of zinc or perchloride of iron, are by no means without avail; they can be applied by the patient himself. Gargles as ordinarily employed are useless, and occasionally are productive of exacerbation of the symptoms. Not so if employed by the method known as that of Von Troeltsch. Of lozenges, I find those of muriate of ammonia much more active in leading to resolution of the venous congestion, than those of red gum, rhatany, etc. Recent investigations show that the astringent properties of tannin have been exaggerated.

Where the uvula is relaxed, the snipping of an elongated portion, *especially if other or constitutional faults are corrected*, may lead to a cure; but in a certain proportion of patients in which the promises

of the specialist as to the good effects to be gained by the procedure are not realized, the cause of failure will be found in non-recognition of the varicose vessels. Treatment of these is best effected by the galvano-cautery point, and it is necessary to seal each individual enlarged vessel. For this purpose it may be necessary to make more than one application. Lastly, there is often a hyperæmic tumefaction of the vessels, glandules, and submucous tissues of the pharynx, naso-pharynx, and turbinated bodies; these will also be best treated by galvano-cautery.

In conclusion, I would say that if it be objected that the conditions I have described are but representative of an advanced chronic congestion, I do not deny that such occasionally may be the case. In the majority, however, there are no such antecedents; and where the two exist, the practitioner will fail to cure his pharyngitis, or what not, until he has recognized and treated the varix.

And it is in this light that I have ventured to call attention to the subject as one that is not generally recognized, for beyond a short communication made at Milan, at the same time as my own, by my deceased colleague, Llewelyn Thomas, I have seen no allusion to it in any text-books or archives, and no notice is taken of it by the great teachers of Vienna. I therefore make no apology for having occupied your time with considerations that may on first hearing appear trivial, or of exaggerated importance.

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## DISCUSSION.

DR. CARL SEILER said: I quite agree with the speaker, that the *globus hystericus* is rarely of purely imaginary origin. Some chronic inflammation of the upper part of the upper air passages usually accompanies this distressing condition. As he truly says, pharyngitis is one of the most common causes of this symptom. At the same time the pharyngitis is to my mind, as a rule, the consequence of remote causes which may be looked for in one of three different directions—in a disturbance of the gastric system, in a disturbance of the respiratory function of the nose and naso-pharynx, and, finally, and most commonly in public speakers and singers, in a faulty use of the organ of voice. This latter condition is frequently met with in those who simply use the voice for ordinary conversation. The constant irritation thus produced leads to hyperæmia and chronic inflammation, which extends upward, rather than downward, into the trachea. In the treatment of the condition described, I think that little can be accomplished by the application of remedies to the apparent seat of the disease, but that the cause must be looked for and removed.



## PECULIAR SEQUELÆ OF MEASLES.

By JAMES COLLINS, M.D.

[Read September 28, 1887.]

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MEASLES is usually considered a very simple affection. The respiratory organs and eyes are usually watched. This being accomplished, and care that aural catarrh is not developed being exercised, measles is considered as having been properly treated.

During the recent epidemic I witnessed some sequelæ from measles in which the nervous system seemed to be especially involved.

CASE I.—A girl of eight years. The fever, eruption, and desquamation followed the usual course; and not until several days after the skin had resumed its normal color, and the bronchitis had disappeared, did the symptoms of chorea develop. This child was a blonde, of Irish parentage. The invasion of the nervous symptoms was gradual, but they developed to a violent degree. During the second week the agitation of the child was so great that she could not remain upon a sofa without being guarded or tied. She was unable to feed herself, and was constantly laughing and giggling, as well as twitching.

Cimicifuga, tonics, and applications to the spine were used. The child recovered, and was well at the sixth week.

CASE II.—A girl of eleven years, of German parentage, a dark blonde, also developed chorea, but in a less violent degree. Similar treatment was pursued, and recovery was complete in the fourth week.

The marked nervous element in these cases causes them to be worthy of note.

CASE III.—Kate A., aged three and a half years—the second case of measles in the house. Eruption appeared at normal period, and followed the usual course. Catarrhal symptoms not more marked than usual. Temperature not above 103°, pulse 110 at highest point.

On the third day of the eruption she exhibited a peculiar irregular kick while in bed. Examination revealed that the reflexes of the ankle and knee were exaggerated; while the ability to stand was greatly impaired, and the coördination of the movements of the lower extremities was imperfect. On the following day she was unable to sit up in bed, the arms kept in irregular motion, while the power of grasp was almost lost for small objects. By the fourth day, hearing was impaired, and by the seventh day eyesight was lost,

and action of the sphincters became uncertain. Blind, deaf, and powerless for self-help, this poor child for five weeks kept up an idiotic cry, with irregular swinging and aimless motion of arms and legs. The special senses gave some objective evidences of such a grave condition. The eye-ground showed the arteries tortuous; veins full; choroid congested; disk seemed to be choked in either eye.

Dr. Lautenbach, who is skilled in the use of the ophthalmoscope, assured me, however, that the condition was that of a swollen disk from active inflammation, and not a true choked disk. *Membrana tympani* of both ears normal. From a hyperæsthesia of the reflexes there resulted a condition of impaired sensation, with subnormal temperature, as a rule. After five weeks under the use of absorbent alteratives, and counter-irritation to spine, the child began to improve, and after twelve weeks commenced to walk and see; hearing was slow to return. The reflexes of bladder and rectum also became normal. Yet the child continued nervous, irritable, howling with raucous voice when disturbed or denied any of her wishes.

During the summer she has gradually improved; now walks with gait somewhat wabbling. She eats well, sleeps well, and nourishes well. Her temper is irascible; she drags the right foot, and falls easily. The motion and use of the upper extremities appear to be normal. Hearing nearly normal. Eye-ground shows evidences of some structural changes; vessels still small and tortuous, some choroiditis remains. Vision has improved so that she can distinguish objects, but my last attempt to test it accurately resulted in ignominious failure.

Urine has shown neither albumen nor sugar. Specimens examined were of normal specific gravity, and deposited phosphates on standing.

The following case presents some peculiar conditions:

CASE IV.—Edward L., aged nine years, had measles in March, 1886. The attack was severe for four days; and in spite of treatment the recovery was slow. He complained of severe headache, and of seeing double at times. During the spring and summer he seemed to be tolerably well, excepting headache, from which he suffered frequently. In July, 1886, his headaches increased. At times his head seemed to be drawn either backward or to one side, the paroxysms lasting four or five minutes, after which he would complain of seeing double. On closing the left eye, vision improved; at times vomited his food with glairy mucus. The lad improved under treatment. Spells of headache became less frequent. As he complained of his eyes, examination showed hypermetropia of 1 D. right eye, 2 D. left eye, with astigmatism in left eye. The optic disk of left eye swollen, right less so. Glasses given in November improved vision, but headache was still persistent at intervals. He got along tolerably well until February, 1887, when headache returned with increasing violence; his gait became unsteady, and double vision increased, becoming almost constant.

In April he was taken to a specialist, who added prisms to his glasses, which, for a time, improved his vision. In May his headaches became violent again; he suffered from attacks of nausea; his gait became more uncertain; he stiffened his feet in walking, and staggered with uncertain movements, frequently falling, but seemed in good spirits; temperature sub-

normal. Urine pale, passed in large quantities, but neither sugar nor albumen detected. Since July the lad has lost flesh; loses his food by vomiting frequently; often the matters vomited are undigested food with glairy mucus, of yellowish tinge. Pain in head always present before vomiting; head thrown backward; belches, often has hiccough. Temperature subnormal; hands and feet usually cold. Generally sleeps well.

The condition of his eyes as I have seen them, and confirmed by Dr. Isett, who is practised in the use of the ophthalmoscope, show both disks swollen; the arteries small and tortuous; veins large, tortuous; choroid congested. Dr. Isett adds, "no doubt there is pressure on the brain somewhere." The treatment of this lad has been tonic, alterative, and dietetic. The case presents a peculiar outcome from measles.

I report these to elicit further reports of such cases, and for the sake of calling attention to the effects of measles on the nervous system, which, in these cases, seems to have suffered severely.

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## DISCUSSION.

DR. WILLIAM B. ATKINSON said: During the last epidemic of measles I saw more cases of inflammation of the lungs than in any previous epidemic within the last thirty-five years. Catarrhal sequelæ were extremely common. I have not met with the eye troubles, nor have I seen any evidences of brain affections.

I recall two cases, some fifteen years ago, in which the eyes and the brain were so affected that vision was entirely lost. In one case the vision returned after a period of fifteen months, and the child recovered perfectly. In the second case, that of a child eighteen months of age, the vision was perfectly restored at the end of eight or ten weeks. I attribute the restoration of vision, in the first case, largely to the use of phosphorus, which, with intervals of rest, was continued for a year.

DR. WM. M. WELCH said: I have never met with the sequelæ referred to by Dr. Collins, but I believe that reference is made to them in elaborate text-books. Such sequelæ are, I think, more frequent after smallpox than after measles. I have seen the hearing and speech affected during recovery from smallpox, but never from measles. The author of the paper referred to sub-normal temperature after defervescence took place. I have noticed this, and also unusual slowness of the pulse. In adults, I have frequently found the pulse under fifty, when in the recumbent posture.

DR. E. T. BRUEN said: The question whether or not in these cases, where nervous symptoms have been prominent, there is any lesion of the nervous system, has always been an interesting question to me. I recently had the opportunity of making a post-mortem examination in a case of typhoid fever where nervous symptoms had been well marked from the second week onward. The patient had always been regarded as an hysterical individual. There was spasm of the muscles of the back of the neck, with retraction of the



head to the right side. Also spasm of the right arm, with contraction of the muscles, and the right leg was similarly affected. The pupils always responded to light, and there was no paralysis of any muscle. The patient died, and in my absence the post-mortem examination was made by Dr. Musser. The only abnormal condition found in the brain was the presence of two cysts, one in each fissure of Sylvius. These were about the size of a walnut. They contained clear fluid. There was no evidence of inflammation or of the presence of hydatids. It is a question whether or not these cysts were congenital. This case shows that there may be marked nervous symptoms without special lesions, and at the same time may we not imagine that some of these cases of severe nervous symptoms in the course of the specific fevers may occur in consequence of imperfect development of the cerebral substance? The only case in which I can recall symptoms similar to those described by Dr. Collins was in a child four years of age, and the result of this case was permanent insanity.

## SOME CASES OF PURPURA HÆMORRHAGICA, AND LEUCOCYTHÆMIA, FROM PRIVATE PRACTICE.

By J. H. MUSSER, M.D.

[Reported September 28, 1887.]

THE following cases are presented for your consideration, not on account of their strict scientific value, but because of the many practical clinical lessons one can deduce from a study of them. They are detailed, not without many regrets for their incomplete nature. Their occurrence in private practice, however, militated much against their perfection. The clinical aspects of the cases will be dwelt upon, only.

CASE I.—Purpura hæmorrhagica. The patient, a married woman, without children, aged forty-two years, resided in Delaware County, and was under the professional care of Dr. Bartleson, of Clifton, to whom we are indebted for the opportunity of observing the case. She had been a dyspeptic all her life, and for fifteen years was subject to hemorrhage from the uterus, due to fibroid tumors of that organ. The prolonged use of ergot checked the hemorrhages, reduced the size of the tumor, and rendered menstruation regular. Apart from these ailments, she had always been healthy, was surrounded by the best hygienic circumstances, and was of temperate habits. She was the only one of eight children who reached adult life. Six brothers and sisters died in early childhood, of causes unknown; one brother died in youth, of rheumatism. Her parents died of acute disease.

In July, 1886, while absent from home, Mrs. A. had an attack of gastro-enteritis. The intestinal symptoms subsided, the gastric continued. Early in August, she returned home for medical advice, on account of epigastric pain and tenderness, flatulency and vomiting, the latter occurring chiefly after eating. The symptoms did not yield, the stomach became more irritable, and very soon blood was discharged from the mouth. Great exhaustion ensued. Nourishment had to be given by the rectum.

*August 19.* Visit with Dr. Bartleson. Patient in bed, quite weak; somewhat anæmic; without fever or much emaciation; mind clear; heart and lungs free from organic disease; pulse weak and rapid; abdomen distended; uterus with fibroid tumors in hypogastrium; epigastrium distended, tender on palpation, without tumor. Liver normal in size; spleen not enlarged. Constant pain experienced in the epigastrium, especially underneath the xiphoid cartilage, aggravated by food. Pain, lancinating in character, also

present. Vomiting excited by even the blandest food, by unsavory odors, or by any untoward movements; frequently without apparent cause. Nausea present almost continuously, excited by blood which was constantly welling up in the pharynx. The ejecta, when vomiting took place, were simply blood-tinged. The nares and pharynx did not reveal the source of the bleeding. The blood was bright in color, airless, mixed with mucus and saliva. There was no cough. There was no hemorrhage in other parts of the body. The urine was normal. No diagnosis was made. The source of the blood was believed to be in the œsophagus.

25th. Patient much weaker. Nutriment per rectum only. Hemorrhage more profuse. No change in the character of the blood ejected. To aid in the diagnosis, and possibly the treatment, lavage was practised. With the first washing blood was not observed by the naked eye, but flakes of mucus floated in the clear fluid. Suspicion of hemorrhage from the œsophagus was thus confirmed. The fluid did not contain hydrochloric acid. Blood corpuscles were seen with the microscope. The presence of latent cirrhosis of the liver with varicosity of the lower œsophageal veins, was considered. The occurrence of thrombosis of some of the veins in the portal area, secondary to some process in the uterine fibroids, with engorgement of the veins of the œsophagus, was also weighed. No definite conclusion arrived at.

27th. General condition more aggravated; no new source of hemorrhage. Visits ceased by the consultant.

September 10. Note by Dr. Bartleson. Purpura on trunk the past few days. Bleeding from mucous membrane of mouth. Extreme exhaustion.

20th. Death from exhaustion, preceded for several days by hemorrhage from all mucous membranes of the body.

Autopsy by Dr. Musser. Fat well preserved. Marked anæmia. Clots in mouth and nares. Universal purpura. A small pin-hole opening in the lower part of the œsophagus was the source of the early bleedings. Blood in the various hollow organs and cavities. Submucous and subserous hemorrhage throughout. Extensive hemorrhage behind the peritoneum, from the diaphragm to the pelvis. Large hemorrhage in the mesentery. Viscera normal. Brain not examined.

*Summary.*—Middle-aged female, free from the hemorrhagic diathesis, in her usual health, after an attack of gastro-enteritis seized with persistent œsophageal hemorrhage. Diagnosis not determined. After five weeks, general purpura. Death from retroperitoneal hemorrhage.

You will observe, in the history of the case, the difficulty of making a diagnosis until the external evidences of purpura were seen. In fact, a provisional diagnosis alone could be made. By the absence of hydrochloric acid in the gastric contents, one might presume carcinoma to be present, and yet collateral evidence could not be found to confirm the suspicion.

Persistent hemorrhage, without patent anatomical cause, extending over a period of weeks, may be, as this case indicates, the forerunner of the general hemorrhages which characterize purpura hæmorrhagica.



Indeed, it is possible a single leakage, causing death from exhaustion, may be the only expression of this grave disease.

It is interesting to speculate on the cause of the ulceration in the œsophagus. Was it present before or subsequent to the gastro-enteritis? It doubtless was due to a thrombus, which might have formed while the vomiting was in progress.

Deaths from purpura are quite rare; with the case just detailed, the following may be of interest. The recognition of the nature of the disease was easy.

CASE II.—F., male child, aged five months, fed on condensed milk. Never of robust health. Skeleton undoubtedly rickety. Family history good. Never hæmophilia. Irregular, disseminated purpuric spots, on trunk and limbs—first appearing two weeks ago. Now universal hemorrhage; considerable exhaustion. The subcutaneous hemorrhages were of two kinds—areas of irregular, tender, deep infiltrations, and round and irregular purple petechiæ, often with a red centre at first. In addition, capillary cutaneous oozings were observed. A small dark pin-head size spot would appear in the skin. A blood-clot would form on the surface of the skin in a few hours. Several of the points bled continuously, being restrained only by styptics. An autopsy could not be obtained.

It is to be regretted, that in neither of the cases was an examination of the blood made for the microbes of this affection, described by Cheyne.

CASE III.—Leucocythæmia. The patient was a man, aged forty-nine years, of good habits, who had always enjoyed good health. His family history and previous personal health record were excellent. He was engaged in an exacting business, and during the past three years had broken down several times each year. These attacks had been attributed by his former medical attendants to malaria. Travel and suspension from duty were necessary to recuperate from them. They were attended with great exhaustion, irregular fever, and marked gastro-intestinal disturbance. They recurred more frequently, and were more grave as the final attack approached. It was noticed that he was gradually becoming anæmic.

I saw him as the junior consultant, in conjunction with his attending physician, during the last two weeks of his illness. He was then extremely pale and emaciated, and marked dyspnoea, and a rapidly acting feeble heart were observed. Lungs and heart normal. Irregular fever, attended with sweating, anorexia, occasional vomiting, and irregular diarrhœa, was present. The mental condition was dull, and at times he was semi-conscious. Deep-seated suppuration and acute yellow atrophy of the liver were thought of as possible causes of the condition. There was slight enlargement of the spleen, but no apparent enlargement of the liver. An aspirating needle was introduced into the liver with negative results. No disease of the kidneys was detected, and examination of the urine excluded acute yellow atrophy of

the liver, or diabetes. The patient continued to sink, and finally died in coma. Shortly before death enlargement of the lymphatic glands in the left axilla and in the right groin was observed. At the post-mortem examination we found the lesions characteristic of leucoeythæmia. The examination of the blood after death also showed the presence of an increased number of leucocytes.

*Summary.*—General failure of health, marked by a series of severe ill-defined attacks of illness. Final illness characterized by stupor and coma, low delirium, incontinence of urine and feces; by dyspnœa and cardiac asthenia; by gastro-intestinal disturbance; by fever and sweats.

The case was of extreme interest. All the organs of the body appeared to be normal. Septicæmia from pus in some part of the body could not be determined, although its presence was suggested. That the cerebral disturbances were not due to renal or hepatic disease was evident. Organic brain disease could certainly not have been coincident, on account of the absence of symptoms indicative of such disorders. Malarial and lead toxæmia were excluded for want of evidence. Unfortunately, the ophthalmoscope was not used. Only very late in the illness was the enlargement of the glands in the axilla observed. It was then learned that with each period of poor health these glands would enlarge and grow tender. The enlargement was not great, however, and could readily have been overlooked. The patient was so ill, when the hypertrophy was discovered, that, in obedience to the friends' wishes, the blood was not examined.

The diagnosis of the affection, therefore, was not made, because two most valuable instruments of precision, the ophthalmoscope and hæmometer, were not used.

CASE IV.—Leucocythæmia. J. H., male, aged eleven years, born in Del. Co., Penna., one of five children, all healthy; family history very good; previous health excellent; never attacked with malaria and undoubtedly not the subject of syphilis. Visited by Dr. Musser in consultation with Dr. Bartleson, April 12, 1887. During the early part of the week preceding this visit, Dr. Bartleson, who was visiting another invalid in the house, was asked to see the lad, who seemed slightly indisposed. A casual examination revealed the presence of swelling in the parotid areas, which the physician attributed to mumps, as the latter was prevailing in the village at the time.

On April 9th, however, more serious attention was given the boy because he had high fever. Enlargement of the cervical, axillary, and inguinal glands was then observed, with increase of size of the liver and spleen. Apart from the fever (102°) the lad made no complaints, and there was no marked disturbance of the bodily functions.

*April 12.* Consultation visit at 5 P. M. Patient sitting up in bed, suffering slightly from dyspnœa. Skin hot; face pale and a little puffy; large crop of herpetic vesicles on upper lip (present two days). Abdomen enlarged and loose, twenty-six inches in circumference at point midway between xiphoid cartilage and umbilicus. The pantaloons he wore one week previously, without discomfort, measured twenty-two inches. General pallor of anæmia spread over face, trunk, and extremities. Marked swelling of neck due to enlargement of the anterior cervical glands. They were distinct, hard, and painless, free from surface discoloration. The lymphatics over the parotid gland and below it were enlarged, but that organ appeared to be normal in size. Two or three isolated glands in the right mammary region were enlarged, and the axillary, inguinal, and popliteal glands were hypertrophied, varying from the size of a small almond to that of a large filbert. There was no œdema of the feet.

On the nipple line the liver dulness extended from the fifth rib to a point midway between the transverse umbilical line and the iliac crest; in the axillary line from the seventh rib to within one inch of the crest, and in the median line from the xiphoid to within one-half inch of the umbilicus. The upper border of splenic dulness began at the eighth rib and its long axis extended in the normal direction to one inch above the transverse umbilical line, extending toward the right to the left nipple line, the borders of each organ could be defined on palpation—hard, rounded, smooth, and painless. The patient complained of epigastric pain and there was marked tenderness on palpation in this area. There was no ascites.

The appetite was good, the tongue coated; nausea was not observed, but fulness and flatulency were marked. The bowels were regular. The pharynx and tonsils were normal. A slight hacking cough, without expectoration, was present. High pitched breathing posterior over the right bronchus, with prolonged expiration, was observed, and at the base râles of congestion were pronounced. The heart's apex was not displaced, its sounds were normal; its action quickened, impulse feeble. Pulse 120, soft and feeble. Mental faculties normal.

*August 17, 6 P. M.* Patient much weaker than at last visit; dyspnœa severe, air hunger. Apex beat of heart in fourth interspace outside nipple line. Pulse 120. Dyspnœa attended with laryngeal cough; inspiration difficult and noisy, expiration easy.

Eyelids puffy; face swollen; very pale; unusually large crop of herpes about mouth. Head sweats. Hands and feet slightly œdematous and pale. No marked general emaciation. Cervical glands but slightly increased in size. Dyspnœa not due to their pressure. Tonsils not enlarged. No pain in larynx or pharynx on deglutition.

Mind clear; sounds in head distressing; sensitive to noise. No alteration of vision apparently. Abdomen measures twenty-seven inches. Liver and spleen readily palpate; the growth of each has extended but slightly.

Flatness on percussion in interscapular regions and dulness over the right apex behind, over which area high-pitched bronchial breathing. Iodine had been applied in the epigastric, umbilical, and hypochondriac regions. In these areas abundant small purpuric spots. In the groins, small papular eruption.

Temperature observed daily. On occasion of first visit it was 103°. Since then it has been falling daily, and is now 99° in the morning and evening.



Blood. Deep plunge secured a drop, which was pale and thin. Red cells, 3,700,000. No large cells; some microcytes. Proportion of white to red, one in forty.

*April 20.* Progressive weakness. Dyspnœa continuus. Abdomen measures twenty-eight inches. Extreme anæmia. Face puffy and pallid. Herpes increased and extreme. No appetite. No fever for the past four days. A frothy blood-tinged mucus alone is expectorated; it does not contain tubercle bacilli. Red cells, 2,100,000. White to red in proportion of one to eighteen.

Death occurred two weeks later of asthenia, the pneumonia having been resolved. No autopsy allowed.

*Summary.*—Rapid enlargement of the lymphatic glands, the liver, and the spleen, in a young boy. Enormous increase of white corpuscles; asthenia and anæmia; herpes and subcutaneous hemorrhages; pneumonia. Duration five weeks.

Diffused tuberculosis of the lymphatic glands and leucocythæmia, alone, were considered in the study of the case. After Fagge, we would consider the age, the absence of fever and emaciation, the enlargement of the liver, the absence of any caseating glands, the rapid course of the disease—all against the likelihood of tuberculosis.

The microscopical examination of the sputum does not go for much, as from the nature of things the boy could not cough or expectorate freely, and hence sputum from the lungs was not obtained.

The lad was so ill we could not insist, after the blood examinations, upon using the ophthalmoscope. Its use would have been of great service. Nevertheless, we deem the diagnosis of leucocythæmia quite correct.

The occurrence of the unusually large crop of herpes labialis was peculiar and instructive. The physical signs in the lungs have been spoken of. The herpes, the blood-stained mucous expectoration, the fever—which subsided in due time—the extreme dyspnœa, and the occurrence of dulness and bronchial breathing, taken together, warrant fully the diagnosis of pneumonia, and, we take it, this inflammatory affection complicated the leucocythæmia.

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## DISCUSSION.

DR. W. D. ROBINSON said: Some time ago I treated some twenty cases of phthisis by the Bergeon method. Three or four of these suffered with purpura. The purpuric spots rapidly disappeared while this treatment was continued. I then made a search for purpuric cases in the Penitentiary, and

found fifteen. These were placed on the use of gaseous enemata, and the spots rapidly disappeared. In three cases there was a slight return on the cessation of the treatment, but when the gas was again employed the spots entirely disappeared. During the past three months these cases have remained perfectly well.

I have also had three cases of leucocythæmia, and these have made more decided improvement under the use of gaseous enemata than with any other form of treatment.

DR. C. D. F. PHILLIPS, of London, Eng., being invited by the President to take part in the discussion, said: The speaker has referred to leucocythæmia. I should like in this connection to say a word with reference to the action of quinia on the spleen. I have found in a large dog, that after the injection of one, two, or three doses of sulphate of quinia into the jugular vein, there is a marked contraction of the spleen, which may continue for two or three hours. The blood-pressure rises invariably during the experiment. I have also experimented upon the liver, and I think that we shall be able to prove that quinia also produces contraction of the liver.

I would make one other remark, although it has no bearing on the case reported. Caffein is useful in certain forms of congestive headache, and in order to find an explanation of its action in these cases, I removed a large portion of the cranium and dura mater of a dog, and then injected caffein. There was a visible contraction of the vessels of the brain. In another dog, prepared in the same way, I applied a solution of the caffein directly to the brain, and the contraction of the vessels was much more distinct. I think that the beneficial effect of caffein in cases of congestive headache, is accounted for by its effect upon the vessels.

DR. G. E. DE SCHWEINITZ said: As is well known, the orange-yellow choroid, the broad, pale, often tortuous retinal veins, and the retinal hemorrhages, present in leukæmic retinitis a remarkable picture. Some time ago a young colored man came to the hospital complaining of defective vision, which was reduced one-half. The ophthalmoscope revealed a wide-spread retinitis, with hemorrhages, and on account of yellow spots arranged concentrically around the macula, the presence of albumen in the urine, and high tension in the arteries, this was supposed to be a case of albuminuric retinitis. The man disappeared for six months, and when he returned a more careful examination of the eye ground cast doubt upon the original diagnosis. Dr. Osler, too, when the case was referred to him, speedily made a diagnosis of leucocythæmia, and the blood showed a truly extraordinary increase of the white corpuscles. The yellow spots in this case were due to a diapedesis of white corpuscles, and not to fatty degeneration, as they are in albuminuric retinitis. The combination of renal disease with this disorder may lead to retinal appearances identical with those found in primary kidney trouble, in addition to those manifested by leucocythæmia. In this case the albumen was due to the pressure of the enormously enlarged spleen. I think that Dr. Musser might have derived diagnostic aid from the use of the ophthalmoscope in his first case of purpura, because, had he found the retinal hemorrhages quite common in this affection, the case would have been sharply separated from the hepatic disorder originally suspected. The ophthalmoscope, in the hands of Dr. Musser and myself, was recently one of the means of leading

to a diagnosis of hepatic coma, previously not clearly made out, which diagnosis I confirmed on the post-mortem table by finding an atrophic and cirrhotic liver, which weighed less than two pounds. I think there can be no doubt that the use of the ophthalmoscope is often quite as important as that of the thermometer or the stethoscope to the general practitioner.

DR. J. P. CROZER GRIFFITHS said: The case to which Dr. de Schweinitz has referred is still under observation in the hospital. The spleen is extremely large, filling the whole left side of the abdomen. When he was admitted to the hospital the proportion of white corpuscles to red was as 1:4. A later examination showed the proportion to be 1:25. In one case of purpura hæmorrhagica I have carefully examined the blood without finding any microorganisms. Culture experiments were not tried.

DR. J. B. WALKER said: I would ask Dr. Musser if, in his first case, he used terebinthinate preparations to check the hemorrhage. I have found, in cases of purpura hæmorrhagica, and in cases of other hemorrhages from mucous surfaces, that the terebinthينات are very useful. These preparations seem to reach all mucous surfaces. I have seen several cases of severe hemorrhage from the intestinal tract, threatening to be fatal, in which the bleeding was apparently arrested by the use of turpentine, after astringents had failed.

DR. S. SOLIS-COHEN said: I have had an experience with a case of typhoid fever which apparently confirms what Dr. Walker has said. In this case purpuric spots appeared shortly before the occurrence of intestinal hemorrhage. The use of turpentine, after the manner directed by Dr. George B. Wood, answered an excellent purpose. I have seen oil of turpentine, by inhalation and through the mouth, arrest hæmoptysis when ergot had failed.

DR. MUSSER said: In simple cases of purpura iron has seemed of service. In the rheumatic cases salicylate of sodium may be employed. Turpentine had been fully tried in the case referred to before I was called. When I saw the patient, the stomach was so irritable that very little medicine could be given by the mouth. I used the wine of hamamelis, much diluted, and aromatic sulphuric acid, well diluted, but without effect.



## COMPOUND FRACTURE OF THE HUMERUS AND INFERIOR MAXILLA, AND OTHER INJURIES, FROM A FALL.

By A. C. W. BEECHER, M.D.

[Read September 28, 1887.]

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F. L., female, aged four years. On May 20, 1885, fell from the third-story front window of her home into an area leading into the basement, a distance of thirty-eight feet; in her descent she probably struck an iron railing on the steps (which were winding) leading to the front door, which railing was somewhat movable from side to side, having become loosened at one end. As no one saw her falling, it is not known precisely how she struck. She was immediately removed to a hospital, where her wounds were dressed, and in two days her mother removed her to her home, and Dr. G. W. Sparks, the family physician, was sent for, with whom I was subsequently associated in the treatment of the case. On May 24th I saw her for the first time with Dr. Sparks, and as she seemed quite comfortable, and the dressings in place, we did not remove them; but on a subsequent visit, not knowing the character or extent of the injuries, and the discharges being profuse and offensive, the dressings were removed, and then we found a deep, lacerated wound on the thoracic side of the right axilla, about four inches in length, extending from in front of the margin of the tendon of the pectoralis major muscle, backward to behind the tendon of the latissimus dorsi, and both of these tendons were somewhat torn (the wound had been brought together by several interrupted sutures when dressed at the hospital, but these had cut out and I did not replace them). No fracture of the ribs, but a fracture of the humerus, probably an epiphyseal separation of the head of the bone from the shaft, as it seemed to be in that situation. A contusion on the posterior surface of the shoulder, over the head of the bone, developed a slough and abscess, which was drained by a seton into the wound in the axilla, so as to prevent the burrowing of pus. The arm was left to hang in a line corresponding with the long axis of the body, and the lower part of the arm and forearm were firmly strapped to the chest by adhesive strips; absorbent cotton and iodoform were placed in the armpit and over the shoulder, and bandages applied over the strips in such a manner as to leave the shoulder bare and the armpit accessible; a felt shoulder-splint, well padded, was then applied to fix the shoulder, and a bandage over the whole. The outer bandage and the splint had to be removed about once in two days to permit the treatment of the wounds underneath; they were washed out by injecting a solution of carbolic acid. The

under bandages were only removed when they became displaced or were too much soiled.

A small bruise was noticed on the right side over the crest of the ilium, this gradually degenerated into an abscess containing about an ounce of pus; an examination did not discover any dead bone, a drainage-tube and carbolized cotton were applied, and in due time the abscess healed very kindly.

About three weeks after the injury my attention was called to a small tender spot and swelling on the under side of the lower jaw, to the left of the symphysis. An examination showed that some teeth in the lower jaw near this point had been broken off in the fall, and that one or two loose fragments remained, which I removed with dressing forceps. There was no evidence of complete fracture of the jaw, no displacement, and no crepitation, yet an abscess developed which was opened externally. Ether was administered for the better examination of the jaw, and a communication was found to extend from the external wound through the jaw into the mouth, and that there were evidences of dead bone, several fragments of which, and two permanent teeth not evolved, were removed, after which it healed up rapidly. Special directions were given that only liquid food should be administered, so as not to complete what certainly was a partial fracture of the jaw, which the act of chewing would have tended to bring about.

The shock in this case was quite severe and an irritative fever set in, the discharge of pus was profuse, the appetite was capricious and poor, all of which produced rapid emaciation, and her life was threatened; a liberal administration of quinia sulph. in syr. glyc. c., whiskey, desertspoonful every three hours, milk, eggs, and beef tea, rigidly insisted upon, she soon rallied. The wound under the arm gradually closed, leaving a neat cicatrix, and about July 1st slight passive motion was instituted, which showed that there was little stiffness in the joint, that the cicatrix held to a slight extent the tendons of the pectoralis major and latissimus dorsi muscles, restraining their actions somewhat; there was also a lack of power in some of the other muscles of the chest, either for want of use or because they had been injured in the fall.

In the latter part of July the child was taken to camp meeting; tripping over a board, she was thrown upon her injured shoulder against a large stone. She was brought home, and an examination revealed crepitation at the point of original separation; the arm was again bandaged to the body, the splint applied to the shoulder, and a recovery soon followed. She had had several other falls before and after the above-mentioned, but with no bad results to the injured member.

We have supposed that in the descent from the window the arm was extended from the body in the endeavor to save herself; that her body struck the railing, producing the laceration; with the arm on one side of the railing and the body on the other, that the body was turned by the resistance, its leverage throwing the force against the humerus near its head, and the leverage of the arm and forearm produced the separation of the head from the shaft. The mobility of the railing, together with its angle of inclination, doubtless broke the force of the direct fall from the window, materially reducing it by the time she reached the arca, and probably saved her from

instantaneous death. How and when in the descent the other injuries were produced is mere conjecture; they probably occurred on the steps in the area.

It seems almost providential that she was not instantly killed, and that she did not perish from shock and septicæmia; the large vessels and nerves of the axilla just escaped most serious injury, which will account for the saving of the arm from gangrene or amputation, or both.

She has recovered, with great mobility of the arm at the shoulder-joint, which will be further increased as the products of inflammation become absorbed, and from use of the limb.

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## DISCUSSION.

DR. O. H. ALLIS said: I think that inasmuch as this was a compound fracture, it would have been good surgery to remove the detached epiphysis. The fact, however, that good union and good motion were obtained, seems to show that this would have been an error. It is also stated by authors, that where separation of the upper humeral epiphysis occurs, this portion of the bone undergoes necrosis, its blood supply not being sufficient to support it. The result of Dr. Beecher's case would seem to indicate that this also is incorrect.

DR. BEECHER said: I am not prepared to say positively that this was a case of epiphyseal fracture or separation, though I believe it was—the injury was so high up. I should like to ask if any observations have been made with reference to the growth of the bone subsequent to epiphyseal separation.

DR. H. R. WHARTON said: I had a case at the Children's Hospital some time ago of a compound fracture high up in the humerus. The upper end of the lower fragment projected into the axilla a distance of two inches. An inch and a half of the lower fragment and a spiculated fragment attached to the head of the bone were removed. The fracture was then reduced and dressed antiseptically and the case did perfectly well. In four weeks there were perfect union and perfect motion. In this case the question came up whether or not there would be sufficient nutrition to keep up the vitality of the head of the bone. It was decided to make the attempt to get union, for if necrosis occurred it would be a simple matter to remove the head of the bone. In connection with Dr. Beecher's question, I can say that in several cases of epiphyseal fracture which I have had under observation for several years, I can detect no difference in the length of the humeri of the two sides.



## NOTES ON THREE CASES OF LEPROSY, WITH PRESENTATION OF ONE CASE.

BY ARTHUR VAN HARLINGEN, M.D.

[Presented October 12, 1887.]

CASE I. *Anæsthetic Leprosy of Mild Type*.—(I am indebted to my friend, Dr. Curtin, for the opportunity of seeing this case, and of following the course of the disease for a year or more.) Señora R. was first seen by me on February 1, 1883. The patient, a native of Cuba, had only been in this country a few months, and could not speak English. She was a stout, lymphatic person, about fifty years of age. Her history, obtained with some difficulty, was essentially as follows:

She had always enjoyed good health until about a year previously, when she was suddenly attacked by vertigo and syncope, followed by a general swelling, affecting chiefly the head, arms, and trunk. A little later, small macular lesions began to show themselves, at first over the forearms, and, later, elsewhere. The lesions, at first brownish-red, grew in size and became annular, leaving a dead-white condition in the centre. Usually beginning singly, the lesions coalesced as they grew larger. The patient's general health had not failed materially.

On examination, the eruption was found to affect the following regions: face, neck, shoulders, back, flexor surface of arms and legs, with some few lesions on the feet. They were macular and maculo-papular in color, most of them being raised above the skin, rather sharply defined, of a dusky reddish-brown color, smooth and without scales. The smaller lesions, from a pea to finger-nail in size, were papular, raised above the skin, and sensitive to the prick of a pin. The larger lesions, from a half-dollar to hand in size, showed a depressed centre of smooth, abnormally white skin with a brown, raised margin, giving them a ringed appearance. In some places these rings intersected each other, giving a figured or gyrate appearance. Where the skin was depressed and white it was anæsthetic to a greater or less degree. In places a needle could be thrust in half an inch or more without the patient showing any sign of pain.

The tips of the patient's ears showed some slight infiltration and thickening, and the nose was somewhat broadened; but the face had not at that time become so disfigured as to present the characteristic leonine appearance, though the surface was mottled with disease patches. The hands were rather puffy and of a deep brownish-red color, and covered with tubercular lesions.

Anæsthesia existed to an extreme degree; a pin could be driven deeply into the back of the hands without causing pain. There was no change in the palm of the hand, nor any referable to a diseased condition of the ulnar nerve, although a general numbness of the finger-tips occurring at times was complained of. The feet were somewhat puffy, but no distinct disease was observed here. The eyebrows and other hairy parts seemed unchanged. There were no general symptoms, excepting languor with occasional headache. There was no history of chills and fever, or of any eruption of blebs.

The patient was at first ordered to take Fowler's arsenical solution in small doses. This was soon changed to sulphate of strychnia, of which she took one-sixteenth grain thrice daily for some months, and, later, one-eighth grain nux vomica with two grains quinine four times a day. The affected parts were rubbed daily with a mixture of three parts oil of cashew with five parts oil of almonds. Under this medication the patient's general condition improved markedly. She suffered with photophobia, however, and other eye symptoms, including the appearance of a small tubercle near the iris. At this time Dr. Harlan saw her with me. Later she suffered from some mental disorder, for which Dr. Curtin attended her. I did not see her from February, 1885, to January, 1886. She had been in Cuba in the interval, and was in a decidedly worse condition than when I saw her last. The face had begun to assume the peculiar leonine expression due to infiltration, with leprous matter at various points. The nose was markedly broadened. New superficial dusky red nodules appeared here and there, especially on left upper and lower eyelids. On the arms and forearms the white anæsthetic patches were sharply defined, and looked as if red-hot coins of various sizes had been laid upon the skin and had burned in. The left arm was the worst, and most highly anæsthetic. The hands showed the most changes. The fingers were swollen greatly, cylindrical curved, and claw-like. Numerous tubercular elevations could be seen scattered over the backs of the hands. A lentil-sized subcutaneous nodule of gristly consistence could be felt under the skin on the back of the left wrist. The ulnar nerve could not be felt. Touch normal. The feet showed deposits similar to those on the hands. They were not, however, swollen nor markedly misshapen.

The eyes looked worse. There was considerable congestion of the conjunctivæ with apparently incipient deposits of leprous matter.

Examination of oral cavity showed nothing abnormal, though her voice was hoarse.

The patient was once more placed under treatment, at first taking one-third grain extract nux vomica thrice daily, and, later, a pill of strychnia, arsenious acid, and quinine. An ointment of pyrogallie acid, at first of the strength of thirty grains, and, later, a drachm to the ounce was prescribed. Ichthyol was also used locally, but the patient objected to the smell and use of the drug, and soon after disappeared from observation.

CASE II. *Mixed Tuberculous and Anæsthetic Leprosy of Moderate Type, accompanied by Marked Eye Symptoms.*—Mrs. P. M., forty years of age; born in Pennsylvania of German parentage; always enjoyed good health. Married at the age of seventeen to a native of Brazil. She lived for ten years with her husband in Philadelphia, bearing him two children, now living and healthy.

In 1873, fourteen years ago, she went with her husband to Brazil, where she settled in Para, while her husband lived in a small town six days' voyage up the Amazon. She saw him only occasionally; but, after six months, joined him, and bore a third child while there—our Case III. She returned with her husband to Para, in a year or so, and they lived there some years, the husband being captain of a steamer trading to San Antonio, at the headwaters of the Amazon, for India-rubber.

About three years ago, she and her family being at that time in good health, she made her first voyage with him up the Amazon to San Antonio. The patient stayed at this place some days, and on one occasion took dinner with a party of natives from the interior. The strange and peculiar food eaten on this occasion made the entire party sick, and our patient attributes all her subsequent misfortunes to this indiscretion. About fifteen days later, her husband was seized with the symptoms of beri-beri, and died in a few weeks.

While he was ill our patient began to observe the first symptoms of the disease, or what she supposed to be such. General nausea and loss of appetite, dizziness, and somnolence, pain in the hepatic region, swelling of the feet, and a sort of intermittent fever. These symptoms lasted for some months. Meantime other external symptoms began to show themselves. Blotches of a whitish color appeared upon the face, which disappeared, and were followed by an increase of pigment over the face and front of legs. Occasional attacks of redness and swelling of the skin, resembling erysipelas, were also observed. Blebs showed themselves on the soles of the feet, at first one or two at a time, later in crops; crusts or scales formed on the edges of the feet, especially about the heels, and dropping off left ulcers behind, which, with the blebs, healed spontaneously. The toe-nails were affected, one nail fell and was reproduced five times. Loss of hair occurred, to a considerable degree, during this period, and the patient's face became disfigured and deformed to a marked degree, so that, when she came to this country from Brazil, about two years ago, she was scarcely recognizable.

In the early part of 1886 this patient was sent to me, with her daughter, by Dr. Charles Turnbull, to whom I am indebted for the opportunity of examining and studying the case. Her condition at that time (she had been four months in Philadelphia) was much improved, but so marked and characteristic was the disfigurement that I recognized the character of the disease almost at once by the peculiar *facies*. This presented the peculiar leonine expression so often described by authors. There were marked deposits in the eyebrows, which were thick and heavy. The tissues of the nose were much thickened, and the nose much broader. The lips were much thickened, and board-like to the touch, and were slightly everted. There had been a sore on the upper lip, but this had healed up when I first saw her, and there were no ulcerated surfaces, either at this time or subsequently. The ears were much enlarged and deformed, the lobes being particularly huge and misshapen. The eyelids were thick and infiltrated, the eyebrows and lashes mostly wanting; there was congestion of the conjunctivæ on both sides, and a small opaque patch on the upper segment of the cornea on the left side. There was brown discoloration on the shoulders and arms, with some anæsthetic patches. The hands were puffy, fingers thickened and cylindrical.



The feet were in the same condition. There were not many anæsthetic patches on the lower extremities.

The patient was ordered a quarter of a grain of the extract of *nux vomica*, with a grain of quinine, three times a day. Under the use of this medicine she improved slowly, but steadily, for some time. She seemed brighter and in better spirits, her voice less hoarse, and her condition improved. Her face, however, continued to show signs of some progress in the disease. On December 3, 1886, when she had been eight or ten months under treatment, the nose was broader, especially at the alæ, and there were new deposits in the skin covering the chin. The tongue, now examined carefully, was markedly thickened, with deep fissures, and a smooth, grayish, board-like surface. It had been chapped and painful, but was now better.

During the previous month the eye-changes had become more noticeable. There was some opacity of the cornea, and several well-marked nodules of leprous tissue in the edge of the iris, and projecting into the anterior chamber of the eye. The patient could only distinguish light from darkness in this eye.

The treatment was continued until toward the close of the year, the patient declaring that she was constantly improving, but no very perceptible change being manifest, excepting that the hoarseness had disappeared, and her voice was clear, and the feet were not so swollen.

On December 22d the patient was ordered two grains of salicylate of sodium, with three grains of potassium iodide. Within a day or two she was attacked by high fever, with a copious eruption of petechial spots. Fearing this might be due to the medicines, both of which are known to produce such an effect, the dose was reduced one-half, under the use of which she improved.

About this time the patient was sent to St. Joseph's Hospital, where her general health improved greatly under careful nursing and attendance. Suspicion having been aroused as to the nature of the disease, she was dismissed.

Since that time she has been living with relatives, and lately has found employment in a small hotel. Her general health has improved, although she has lost flesh. The leprous deposits about the ears and face are more marked than before, and I am inclined to think that the utmost that can be asserted is that the patient is losing ground very slowly. She has been taking, since the beginning of the year, a solution containing one-twentieth of a grain of sulphate of strychnia, with two grains of quinine, thrice daily.

CASE III. *Marked and Severe Anæsthetic Leprosy in its Earlier Stages.*—Anita M., daughter of Case II., above described, aged twelve and a half years, was seen, for the first time, a year and a half ago. No history could be obtained, excepting that the disease began about the same time as that of the mother.

Attention was first drawn to the child by the appearance of a well-marked raspberry-colored circinate eruption on her face, resembling most closely that of erythema multiforme. Only a few of the lesions were at this time decidedly anæsthetic. On stripping the child circinate lesions could be seen over the body and limbs. These patches were whitish in the centre, slightly sunken, and surrounded by narrow brownish-red, slightly elevated borders, which had intersected at many points large gyrate figures. The patches on the lower limbs were all more or less anæsthetic, and did not seem to follow the distribution of any particular nerve, but to involve large irregular areas.

The patient was placed upon the extract of nux vomica and quinine, and later, in addition to this, salicylate of sodium, in five grain doses.

No very marked change occurred during the summer of last year, but with the approach of winter the child's general condition became markedly worse. She suffered from conjunctivitis, and later from various nervous symptoms, prominent among which was an attack of temporary loss of power in the lower limbs.

The little patient's aspect began to change from this time, the lesions in the face taking on a more decided tubercular character, and her aspect being dull and stupid. The anæsthetic areas became more marked, particularly those connected with the ulnar nerves. The hands and fingers became numb and gradually the fingers, particularly the ring and little fingers, became crooked, and nearly immobile, presenting precisely the appearance known as *mains en griffe*. At one time she was seized with pains in the groins, running down the limbs, and confining her to bed several days. At another time she had rheumatoid pains in the various joints of the lower limb; and at another swelling in the left hand. There was a cardiac mitral murmur. Chorea followed these attacks in May last, for which I consulted Dr. Mills, who prescribed Fowler's solution, five minims, with four minims of extract of conium, thrice daily. Under the use of this combination the little patient's general health improved, and the choreic symptoms disappeared by the middle of August.

The disease, however, has continued to make steady progress. The nodules on the face have somewhat enlarged, and the tongue has shown signs of involvement.

The ulnar nerves on both sides can be distinctly felt from the elbow to the shoulder, rolling like large whip-cords under the skin. They are quite painful to the touch.

I have brought forward the notes of these cases with the purpose of pointing out the peculiarities of leprosy as it presents itself in the earlier and comparatively mild stages of the disease, and with the view of assisting, in some degree, in familiarizing us with its most numerous symptoms.

The matter is one of practical importance, for there is no question that the disease is on the increase in this country, and before long we may be called upon to decide what course is to be taken for the protection of the community, and, not less important, the care of the unfortunate victims of this disease.

In addition to the fact that centres of leprosy exist in Canada, in Minnesota, in Louisiana, and in California, several cases have been reported as occurring *de novo* on American soil in persons who have been born in, and have never left the country.

Under these circumstances it behooves each member of the profession to ascertain and make himself familiar with the appearance of leprosy, so as to be able to recognize it at sight, to make up his mind

with regard to the contagious character of the disease, and, finally, setting aside all sentiment and ignorant fear of the malady, to do what can be done for its removal.

I question if, at present, these patients of mine would be received by any hospital in this city were the nature of the disease known. I question if there be any refuge to which these poor lepers can resort when the time comes that those around them shall be aware of the affection from which they suffer. In the face of a disease which has, for ages, been accounted one of the most dreadful plagues, it is not surprising that uninstructed persons should be struck by blind panic. But it is the duty of our profession to instruct the public in this respect.

Leprosy is, indeed, contagious in my belief and in that of the majority of observers; but contagious in a slow and uncertain manner. Therefore we need have no such fear in approaching it as we should have in coming in contact with syphilis, much less any of the contagious exanthemata.

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## DISCUSSION.

DR. C. S. TURNBULL said: Dr. Van Harlingen has described the cases so carefully that very little is left to be added. With reference to the second case, it will be of interest to state that when the woman first presented herself at the Eye Department of the Dispensary of the German Hospital, we were led to believe, from the appearance of the eye, that she was suffering from syphilitic iritis. The primary affection began in the iris. There were pain and plastic exudation, and the other symptoms usually complained of. The disease, however, failed to yield to specific treatment. Subsequently nodes appeared upon the conjunctiva of the left eye, and later one commenced to form upon the cornea, closely resembling a case of (Arlt's) lymphatic keratitis, and finally involved the entire cornea. About last December the centre of the anæsthetic nodule began to break down, and we believed that the eye was about to perforate. This, however, did not occur. The opening closed over the eye remaining in about the same condition in which it is at present, with the exception that every portion of the cornea has become involved, and is now one anæsthetic leprous nodule. Having once started in an eye, this affection is slowly but surely fatal to the sight. A suspicious spot is seen on the conjunctiva of the fellow eye, and we fear that if the affection starts in the cornea of that eye the woman will soon be completely blind.

DR. J. W. HOLLAND said: I regret that I have no personal experience to communicate. In the interior, where I resided for years, leprosy was practically unknown. In Minnesota, where the disease is endemic, I fancy that it has been brought there by the Norwegian emigrants, who are very numerous in that State. The same is probably true of Canada. I believe that, as a



rule, the distribution is largely on the sea-boards. I have seen the disease in New Orleans some four years ago. I saw a case in the Charity Hospital of that city in the later stages of ulceration. The pain was so severe that the patient had to be kept under the influence of morphia. The physicians did not consider the disease contagious, and they have had considerable experience with it. At one time there was a leper hospital in the vicinity of the city, but at present the cases are treated in the ordinary hospital in wards with other patients. At the same time there were in the out-patient department two children suffering with the same disease, and the affection was supposed to be due to the character of the food. It was thought that the eating of stale fish had something to do with it. This idea was not based upon any research into the constitution of the food, but rather from the fact that the persons affected with this disease lived, as a rule, a maritime life, and being in the lower walks of life had to take what food they could get. It was also recognized that the disease might be inherited.

DR. H. W. STELWAGON said: I hesitate to express a positive opinion regarding a disease which I have seen so little clinically. Various views of the etiology of the disease have been held from time to time, and even at the present time these differences prevail. It was formerly charged to dietary and climatic influences, but these, as exclusive factors, have been disproven. Another view holds that its spread is due entirely to hereditary transmission, but a study of the affection has excluded this as a main etiological cause. Later opinions are that the disease is contagious through inoculation, a view that has much in its favor, but this, also, has been disputed by some writers who have been in position to study the disease. One fact, that appears to be against this view, is that in Norway, where there are from two to three thousand lepers, the number of cases has been steadily decreasing for the last fifteen or twenty years. This decrease is due, it is true, in a measure, to the establishment of lazarettos, but not entirely so, for these contain not more than one-third of the whole number of lepers. At the present day, therefore, more or less doubt still exists as to the nature of this disease.

DR. W. OSLER said: The questions with reference to the contagiousness or inheritance of leprosy are, of course, exceedingly interesting. Dr. Graham, of Toronto, has made an elaborate study of the disease as it occurs at Tracadie, New Brunswick, and has come to the conclusion that the disease is contagious, and that it is not transmitted by inheritance. There, as in Norway, the cases have been progressively diminishing in number. Certainly, if contagious, it must be so in a very slight degree. It is probably not nearly so contagious as ordinary tuberculosis.

I would ask Dr. Van Harlingen, whether he has made any examination of sections of the skin in the second case. We may, however, take it for granted that bacilli are present.

I have had few opportunities for seeing leprosy. A case of interest which came under my observation in Canada, was that of a man occupying a prominent position in one of the religious denominations, who had suffered for some thirty years with the anæsthetic variety, and whose sight was finally destroyed by leprous keratitis.

DR. A. HEWSON said: I should like to make a few remarks with reference to the treatment of this anæsthetic form of leprosy. I have seen some-

thing of it, and recently resorted to a plan of treatment which I may say was suggested to me by the lecture of the President of the Society on Bergeon's use of gas, as in the treatment of phthisis. I resorted to this expedient in a case where the bacilli were recognized in the skin. I applied the mixture of gases to various parts of the skin, especially the lobes of the ears, by means of inverted funnels, for twenty minutes each day. There was a perceptible reduction in the induration in the course of twenty-four hours, and at the end of ten or twelve days there was such an improvement that one would hardly have recognized him as the same patient.

I may say in this connection, that I have been treating cases of keratitis with granular lids by means of these applications of the sulphuretted hydrogen and carbonic acid gases together. Within twenty-four hours there is such a reduction in the swelling and induration that the lids, which before could not be everted, can be examined without difficulty, and the presence of granular lids as the cause of the keratitis demonstrated. The application in all such cases proves acceptable to the patient by its characteristic sensation of gentle warmth to be felt in the part.

DR. VAN HARLINGEN said: My object, to-night, was simply to exhibit this case of leprosy, and not to read a paper on the disease, I have, therefore, not referred to certain of the points brought out in the discussion. I have not yet made such examinations as Dr. Osler has suggested, but I shall be glad to do so. My main reason for not making sections was, that I did not wish to run the risk of producing lesions that might give the woman trouble. I see, to-night, that she has cut her hand severely. If these wounds heal kindly, I shall be tempted to remove a piece of the diseased skin for microscopical examination.

The treatment has been referred to. It may be said that as the cause of the disease lies in bacillar infection, anything that will kill the bacilli will probably benefit the patient. Dr. Unna, of Hamburg, from a study of certain cases, has come to the conclusion that a great deal of benefit is to be obtained by the application of certain agents which kill the bacilli. How far this method will prove effective I do not know. That it will prove effective in the anæsthetic form I very much doubt. The reason that a patient has anæsthetic patches is not that the bacilli are in the skin, but that they are deposited in the nerves which supply these patches.

## CHRONIC RHINITIS AS AN ETIOLOGICAL FACTOR OF ACNE OF THE FACE.

BY CARL SEILER, M.D.

[Read October 12, 1887.]

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FOR a number of years I have made the observation that acne vulgaris and acne rosacea coexisted frequently with chronic rhinitis, and particularly with the atrophic form of nasal catarrh, but it is only lately that I have come to the conclusion that this form of nasal disease is in many cases of acne the exciting cause. This conclusion may seem far-fetched and perhaps unreasonable at first glance, but I hope to be able to show that there is undoubtedly a close connection between the two affections. For this purpose I will give a short history of a few of the cases which have come under my observation, before entering upon a theoretical discussion of the connection between chronic rhinitis and acne.

CASE I.—J. H., aged thirty-eight years, a broker by profession, consulted me for chronic nasal catarrh. He stated that he had suffered from stoppage of the nose for several years, and that every morning he blew out large scabs. After this his nose felt clear but dry, and he had lost the sense of smell to a very large degree. For two or three years he had noticed a redness of the external integument of the nose, which had become gradually worse, so that at the time I saw him it had spread from the nose to the cheeks, and pimples had made their appearance. The rest of his face was free from pimples or redness. On inquiry as to his habits, he said that he had always been a total abstainer from alcohol in any form, and the redness of his nose was the more annoying to him, as it gave rise to jocose remarks on the part of his friends. His general health was good, and there were no symptoms of gastric disturbance.

On examination, I found the anterior nasal chambers filled with dry scabs of hardened mucus, and having removed them, saw that the mucous membrane below them was unusually pale, both on the septum and over the turbinated bones. The lower turbinated bone was barely projecting from the wall of the nose, and the turbinated cavernous tissue apparently absent, as no impression could be made by pressure with the probe. This condition caused



the anterior chambers to be abnormally large, so that the posterior wall of the naso-pharynx could easily be illuminated and viewed through the nostrils. Irritation with the probe caused but a very slight amount of moisture to gather around the spot touched, while the whole of the mucous membrane was abnormally dry. There was no odor.

The treatment consisted in cleansing the nasal cavities morning and night with an alkaline wash, and in stimulating the mucous membrane with dilute nitrate of silver in powder, a small quantity of which was blown into the nostrils two or three times a week. In order to keep up the stimulation a tampon of cotton was introduced into the anterior nasal chambers placed against the side of the nose, in place of the atrophied inferior turbinated bone, which tampon was renewed by the patient after the cleansing morning and night. As an application to the skin I prescribed a lotion consisting of alcohol and precipitated sulphur, to be applied every night with a tuft of cotton, and to be washed off in the morning with soap and water.

Under this treatment the acne gradually diminished, and the mucous membrane of the nose became again bathed with secretion, until after a little over three months the redness had entirely disappeared, and the cotton tampons could be dispensed with, because the lower turbinated bones, or at least the cavernous tissue, began again to project into the lumen of the anterior nasal chambers. I saw the patient again three years later, unfortunately without having an opportunity of examining his nose, but he told me that there had been no return of the acne, and that his nose troubled him but little, and then only when he neglected to use the alkaline wash; the sense of smell had also returned to a large degree, but was not as acute as he might wish.

CASE II.—A. L., aged twenty years, machinist, from Wilmington, had had scarlet fever when ten years old, and since then had suffered from nasal catarrh. At about the age of puberty pimples began to appear on his face, which gradually became larger and more numerous, until, when I saw him, his face and even neck were covered with various sized pustules in different stages of development. In the free spaces between them comedones were numerous, and at the angles of the jaw and on the neck were large scars, forming pockets in some instances, caused by confluent acne pustules. His general health was good. On examination, I found practically the same condition of things as in Case I., except that a disagreeable odor was present, and a perforation of the septum existed. This latter circumstance led me to inquire for syphilitic infection, but I could not elicit anything pointing to the existence of even a taint, but found that he had been in the habit of picking off the scabs of hardened mucus from the lower portion of the septum with his fingernail, and had thus gradually scratched a hole into the cartilaginous partition.

Having at that time a suspicion of the connection between atrophic rhinitis and acne, I directed, for the sake of experiment, the treatment solely to the nasal chambers, and intentionally made no applications to the acne pustules. The treatment in other respects was the same as that adopted in Case I. On account of the distance of the patient's home from the city, I saw him but seldom, and it was several months before much improvement was noticed. However, in the course of about eighteen months the acne had disappeared entirely, as had also the comedones, and the chronic rhinitis had so far yielded to the treatment that the patient considered himself cured.

CASE III.—Miss E. S., aged twenty-two years, school-teacher, general health moderately good, has felt a stoppage of the right nostril for some years, while the left nasal chamber was free but very dry, so that she had to use cosmoline or cold cream every night before she felt at all comfortable. In the mornings she occasionally expelled a small scab of dried mucus of a yellowish-green color. On her face were numerous pimples and comedones, but distributed more largely on the left side. When asked, she stated that the pimples had made their appearance two or three years ago; had always been more numerous on the left side of her face, and did not seem to have anything to do with her diet, as she had, at the advice of her physician, abstained from various articles of food for considerable periods of time, without apparently producing any effect upon the acne. Her monthly periods did not seem to her to produce any increase in the number of the pimples.

An examination of the nose proved this to be one of those cases which are occasionally met with, in which we find an atrophic condition on one side coexisting with a hypertrophy of the turbinated cavernous tissue on the other. The left nasal chamber being abnormally large, its mucous membrane pale and dry, and the lower turbinated bone hardly visible, presented the same characteristics as described above, and for this condition the same treatment was adopted, viz., stimulation with nitrate of silver and powder, and the cotton tampon after the dried secretion had been removed. The other nasal chamber presented the well-known features of the hypertrophic nasal catarrh, with its injected mucous membrane, from which a copious flow of secretion is poured at the slightest irritation, its projecting turbinated tissue which obstructs the lumen of the lower meatus, and its frequent projections, from the septum. Here an entirely different treatment had to be adopted, which it is needless to describe here in detail; in fact, the two sides of the nose were treated as though they were two separate and distinct cases; the one an atrophic, and the other one of hypertrophic rhinitis. The sulphur and alcoholic lotion was used in this case, as it was important to the patient to get rid of the acne as soon as possible, which happy result was accomplished in a remarkably short time, to her great delight.

The above short notes of three cases will, I think, suffice to show that there is a connection between atrophic rhinitis and acne of the face. Although a large number of such cases could be cited to demonstrate still further this point, I think it would be waste of time to do so, as they are all more or less a repetition of each other.

According to the statements of the different authors on skin diseases, acne occurs with equal frequency in both sexes, and usually makes its appearance at the time of puberty, and is frequent until the age of thirty. As predisposing causes are mentioned, gastric disturbances, either lack of or excess of sexual connection, onanism, insomnia, and intemperance, but no mention is made, in any of the works to which I have had access, of atrophic rhinitis as a predisposing or existing cause. That the sexual organs have a great influence upon the

production of the disease cannot be doubted, for many cases are cited in which acne showed itself only during pregnancy, or at the menstrual period, in women; and it disappears with the cessation of the practice of self-abuse in boys and men; also, the fact that it is most frequent at puberty, would point in that direction. Some authors lay so much stress upon this that they direct their treatment altogether to the sexual organs, by passing a bougie into the male urethra, and prescribing vaginal douches and medication, having no faith in local applications to the skin of the face.

Speaking of the pathology of acne Veiel says: "The cause of the inflammation is the mechanical irritation by the inspissated secretion, the latter again is due to deficient glandular activity, because, owing to the defective elaboration of sebum, the secretion has time to dry in the efferent duct."

Berend explains the new formation of acne efflorescence by assuming that the swelling of the inflammatory areola around the acne pustules and nodules, occludes the efferent channels of neighboring glands. Similar views as to the pathology of the disease are expressed by others.

It would seem, therefore, that two factors must act in conjunction with each other to produce acne, the one to act as an obstruction to the efferent channel of the sebaceous glands by the introduction of dirt into it, and the drying of the secretion behind it, producing the so-called comedones, and also a diminution in the activity of the gland itself, which causes an alteration in the consistence and quantity of the secretion, which thus is not able to remove the foreign body in the mouth of the duct by pressure from behind, as undoubtedly occurs in the healthy skin. Thus the retention and accumulation of the secretion causes by pressure a localized inflammation, which is finally relieved by the formation and evacuation of pus. In acne rosacea, the rarer form of the disease, we find no formation of pustules, but simply a general more or less diffused inflammation, which is probably due also to a perverted action of the sebaceous glands, but does not lead to a retention of the secretion.

I have not been able to find an opinion expressed in any of the books as to the direct cause of the glandular irritation, whether it is altogether local, and caused by obstruction of the duct in the formation of comedones, or whether it is due to reflex nervous irritation, or finally is produced by a more or less general disturbance of the capillary circulation in the skin of the face.

The first of these propositions may be at once set down as insuffi-



cient to explain the pathological condition, for comedones are frequent in almost every face without being necessarily accompanied by acne. The other two propositions may be considered together, for we cannot have inflammation without disturbance of the circulation, and no disturbance of the circulation without nerve influence.

The above cited predisposing causes clearly indicate that an irritation of the nervous system must exist somewhere, be it in the mucous membrane of the stomach or in the sexual apparatus; which, by reflex, acts upon the easily influenced capillary circulation of the skin of the face and neck, and thus by causing a change in the capillaries around the sebaceous glands causes a perverted action of these glands if it is kept up for any length of time, or if no relief from blood-pressure is afforded. It is my belief that the cavernous tissue covering the turbinated bones provide such a relief, and that this is one of the functions of the erectile tissues of the body. This belief is strengthened by the fact that under mental excitement which causes blushing of the face, the cavernous tissue in the nose swells up, while, on the contrary, under any emotion which causes paling of the face, the erectile tissue of the turbinated bones becomes paler, and diminishes markedly in bulk, facts well known to every laryngologist. Let this cavernous tissue be absent, or greatly diminished, as is the case in atrophic rhinitis, and very little or no relief is afforded for the excessive blood-pressure in the capillary circulation in the skin of the face, and the result will be acne if any of the predisposing causes be present. In the cases above cited, and in many others under my observation, the acne disappeared *pari passu* with the reformation of the cavernous tissue, and thus these would seem to be of some importance as clinical proofs of this theory.

I am fully aware that a single line of cases observed by one observer are by no means a sufficient guarantee for the acceptance of a theory, and it will require many more cases observed by many observers, to prove or disprove it. At the same time, I cannot but think that atrophic rhinitis may be one of the etiological factors of acne.

## MIGRAINE IN CHILDHOOD.

By WHARTON SINKLER, M.D.

[Read October 12, 1887.]

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MIGRAINE is more common in children than is generally realized. Popularly the attacks of "sick-headache," which many children have, are attributed to disorder of the stomach from some indiscretion in diet, and many physicians hold the same view.

The fact that migraine is a disease which is especially likely to begin about the period of puberty has long been recognized, and this point has been insisted upon by Anstie. Many children begin to suffer from characteristic attacks as early as seven or eight years of age (Eulenberg speaks of a girl who suffered from excessively severe attacks from her fourth year), and continue to have them until adult life is reached; or, indeed, the attacks may continue all through life. Still, it is most often the case that when migraine begins in early childhood, it becomes more severe at puberty and ceases by the time full development is attained.

The influence of hereditation is seen to a marked degree in migraine, and the affection often seems to be directly handed down from one generation to the next. It is transmitted from parent to child, and may follow either the male or female line, descending from father to son or from mother to daughter.

The children who suffer from migraine often belong to neurotic families, and it is common to find among the near relatives instances of other nervous disorders. It is, then, important for us to be on the lookout for migraine in children who belong to families with nervous tendencies.

I have now under my care for sick-headaches a lad of fourteen years, whose mother has violent attacks of neuralgia, and one of his sisters is a well-marked example of hysteria.

It is a well-recognized fact that children who suffer from this

disease at and before the time of puberty may, in later life, become the subjects of some of the grave neuroses, such as epilepsy or insanity. The great value of the early recognition and cure of the disease is, therefore, apparent.

In addition to the influence of heredity, there are many other causes which may induce migraine in children. The manner in which a child is brought up has much to do with the production of these attacks. Improper food, bad atmosphere, and, above all, an insufficient amount of sleep with overtaking of the brain, all tend to predispose to or directly bring on migraine. When a child first begins school he often complains of more or less headache. The close air of the school-room and too little exercise are enough to account for some of these headaches. In other children, mere mental effort brings on attacks of pain in the head. The same thing holds good of migraine that I have observed in chorea, namely, that it is the studious, ambitious children, who stand at or near the head of their classes, who suffer from both of these affections. In many instances there are ocular defects, which cause eye-strain, and in these cases the attacks of migraine continue to become more and more frequent in proportion as the eyes are used, until the eye-defect is corrected by glasses. It is not in all cases, however, that the headaches which follow excessive use of the eyes are due to ocular defect. The following case, which Dr. G. de Schweinitz has detailed to me, illustrates this fact:

Charles C., aged fifteen. A slender lad, who has grown rapidly; clear, fair skin; slightly anæmic. No noteworthy illnesses. Goes to school and studies hard. One year ago he began to have headaches, as follows: sudden hemiopia, followed by intense pain on left side of head, and marked numbness along the arm of the corresponding side, and terminating finally in nausea and occasionally in sick stomach. Attacks varied in frequency and in severity. With the exception of the migraine, the anæmia and an imperfect digestion, no unsoundness was discovered.

*Examination of eyes:* color of eyes blue; pupils normal and equal. Vision: R. E.  $\frac{15}{XV}$ ; L. E.  $\frac{15}{XV}$ . Accommodation: R. E. 8.5 D.; L. E. 8.5 D. Muscular anomaly, slight insufficiency of interni; color perception normal; refraction error, hypermetropic astigmatism. *Ophthalmoscopic examination:* R. E., nerve of normal color; slight conus out, and some retinal striation around disk; choroid disturbed; numerous lymph reflexes. L. E., similar disk; retina more striated, with veiling of lower edges of disk. Field of vision normal.

The treatment in this case was largely dietetic and hygienic. The medicines used were, after the correction of the dyspepsia, syrup of the hypophosphites, strychnia and iron. The refractive error was not corrected. The headaches have practically ceased.



Migraine from eye-strain is not uncommon in children. Dr. de Schweinitz has kindly furnished me with the following case, which is also of interest on account of the superficial optie neuritis which exists :

W. C. W., aged seven. When two years old had "gastric fever," from some imprudence of diet given by a careless nurse. Has had whooping-cough and varicella. Since two years of age, has experienced great difficulty in digesting and assimilating food, often going for long periods without being able to take any solid food. One and a half years ago, or when he began to go to school, began to have dull frontal headaches. Occasionally has paroxysmal headaches, quite different in type, beginning with extreme pallor, violent head pain confined to one-half of forehead, and followed by nausea, but no vomiting. There are no visual disturbances preceding these attacks and no auræ of any kind. These headaches have been present since he was two years old. An unusually healthy looking boy; lives in the country. Examination of urine negative. The boy is unusually bright and quick at his lessons, but has not been pushed.

*Examination of eyes:* color of eyes blue; pupils normal and equal.

Vision: R. E.  $\frac{15}{xv}$ ; L. E.  $\frac{15}{xv}$ . Accommodation: R. E. 12 D.; L. E. 12 D.

Muscular anomaly, insufficiency of superior recti; color perception normal; refraction error, hypermetropia = 1 D. *Ophthalmoscopic examination:* R. E., disk an irregular oval; all edges hazy, those on nasal side hidden; surface of disk gray-white; lymph sheaths full; veins tortuous. L. E., nerve oval; all edges, especially nasal, hazy; veins full and tortuous.

Diagnosis: Superficial neuritis and hypermetropia.

Migraine does not appear to affect one sex more than the other, but if any difference does exist the preponderance is in boys. Precocious sexual development in either sex often leads to this form of headache. It is astonishing at what an early age evidences of sexual irritation may appear. Bad associations and influences lead a child into thoughts and practices which are unwholesome in the extreme, and bring about disorders of the whole nervous system. Even before puberty arrives the nervous system undergoes a preparatory change, and if there are evil conditions in the surroundings of a child to excite sexual irritation, puberty is hurried forward. Under these influences a child becomes hypochondriacal and moody, complains of various ailments—some of which are real and some fancied—and may suffer from real neuralgias.

It is very seldom that we meet with migraine in robust and hearty children; but it is seen in those who do not get enough fresh air and who are thin and pale; or in children who think and read too much, and who do not romp and play, but prefer to sit with older people and drink in conversation far beyond their years.

The symptoms of migraine in young children are not far different from those in adults. The attacks are markedly paroxysmal, occurring from two to six weeks apart, and become more or less frequent, according as the conditions for their development are favorable or otherwise. There may be only one or two attacks a year. The attacks may be preceded by premonitory symptoms, such as chilliness, and a feeling of lassitude, and the child is dull, and indisposed to play. Sometimes there are subjective ocular symptoms in the form of specks floating before the eyes, *muscæ volitantes*, or balls of fire, and bright zig-zags. Occasionally the child complains of hemiopia, as in Dr. de Schweinitz's case before quoted. These symptoms last a half hour or more, and may be followed by subjective numbness of the tongue, lips, or of the entire half of the body. Putnam<sup>1</sup> had a patient in whom in boyhood migraine was represented by repeated attacks of numbness and tingling of the right side of the face, and right half of the body, with aphasia, and hemianopsia, followed by but trifling headache, or none at all. Later in life there were severe attacks of pain. Usually as soon as the subjective auras disappear the pain begins. At first the pain is dull, and it may be confined to one side of the head; generally, in children, the pain is on both sides of the head, at least they complain of the pain as being general, and it may be either frontal or occipital; most frequently it is frontal. Anstie says this is common of all neuralgias of children—*i. e.*, to be frontal, and to affect both sides simultaneously. There is often nausea throughout the attack, or it may terminate in vomiting, or a free flow of urine, or sometimes there are two or three diarrhœic stools. After the crisis is reached the child may fall asleep, and after a nap waken well. The attack does not always terminate in a crisis; after a gradually increasing headache for several hours it gradually subsides. The face in the beginning of an attack may be pallid, and as the pain increases the face becomes deeply flushed, and the eyes suffused.

The treatment must be preventive and curative. If a child is of a neurotic family, in which there are already instances of neuralgia and migraine, we should urge the parents to see that he has as wholesome a life as possible. Insist on ten hours' sleep a night, and keep him from too prolonged application to his books. Six or seven hours of study in the twenty-four is enough for a growing child. Encourage outdoor sports of all kinds, and, if possible, keep such a child in the

<sup>1</sup> System of American Medicine, vol. v. p. 1231.

country for many months in the year. The diet should be abundant and nutritious, milk, eggs, soups, and broths, with meat in moderation, and the various cereals, and plenty of vegetables and fruit. Such children can eat largely, and plenty of fatty articles of food is well borne and is of great advantage.

There is a great tendency, in the education of both girls and boys, to over-cramming, and to over-stimulation, to reach a high educational standard; but it is encouraging to see the effort which is now being made in our schools to vary and widen the course of study. The introduction of manual art into the public schools is of inestimable value to the children, not only because it gives them dexterity and skill in the use of the hands which becomes of practical advantage later in life, but it trains the minds in studies which are, so to speak, external in their kind.

As physicians, we cannot too strongly discourage the taking of young children to the theatres, when, not only the late hours and bad air are injurious, but the impressions produced by the plays must be pernicious to an extreme. One cannot go to the theatre now without seeing children of all ages looking on at every variety of performance, from the most décolleté spectacular ballet to a melodrama of the highest intensity.

If a child has already begun to have attacks of migraine, nothing is of more value than attention to the general health. Such children are often pale and thin, and have but little appetite. If change of air can be secured, it is often enough to obtain relief from the attacks. If we cannot send the patient away, we must resort to tonics and good feeding. Cod-liver oil, if it can be borne by the stomach, is of the greatest possible use in such cases. If the child cannot take oil, we must introduce fat into the system in some other way. Cream and plenty of butter may be given. Devonshire clotted cream, which is now to be obtained at the Alderney dairies, is relished very much by children.

Special anti-neuralgia drugs are seldom indicated in these cases, but sometimes the bromides may be given with great advantage, especially in those children who are of a very nervous temperament, and in whom any effort at brain-work causes headache. It should be given in small doses, and continuously for some weeks.

The following case shows what can be accomplished by the improvement of the general health by iron and change of air, together with removal from school:



Joseph C., aged fourteen, applied at The Orthopœdie Hospital and Infirmary for Nervous Diseases for treatment May 16, 1887. Is one of a highly neurotic family; the mother and two sisters suffer from neuralgia, one sister has attacks of migraine, and another sister is subject to attacks of hysterical seizures. His father is a strong and healthy man.

Has had no severe illness; but, when three years old, had a fall, striking his temple against the corner of an iron bedstead. For the past two years he has had attacks of pain in both temples, once or twice a week; they are more frequent in summer. The attacks usually begin while in school, and the pain is so severe that he has to go to bed. The headaches generally terminate in vomiting. Violent exercise may bring on an attack, so he seldom plays. He seems well nourished, and he has good digestion.

Dr. de Schweinitz examined his eyes, and made the following report:

*Examination of eyes:* color of eyes blue; pupils normal and equal.

Vision: R. E.  $\frac{15}{XX}$ ; L. E.  $\frac{15}{XX}$ . Accommodation: R. E. 11 D.; L. E. 11 D.

Muscular anomaly, slight insufficiency of interni; color perception, normal; refraction error, hypermetropia = 1 D. *Ophthalmoscopic examination:* R. E., small, oval disk; coarse retinal striation over and around disk; choroid ring to nasal side; lymph sheaths distended along veins; choroid disturbed. L. E., small, oval disk; choroid ring nasal side; dense retinal striation; veins distended and lymph sheaths full along arteries and veins; maculas normal.

He was ordered milk and abundant plain diet, and given a tonic of cinchona and iron. He was also fitted with glasses. The attacks diminished in frequency, as well as in intensity in a few weeks, and are now very rare.

In many cases some ocular defect will be found which will require correction by glasses, and many cases of migraine in children have been cured by this means alone. In all cases of migraine we should look carefully into the condition of the teeth, and have any unsound ones filled or removed.

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## DISCUSSION.

DR. C. M. SELTZER said: I wish that the author had been more explicit with reference to the dietetic treatment of these cases. I infer from his remarks that the majority of his patients have been under-fed. Most of the cases that I have observed have had an excess of nitrogenous articles, with a lack of sufficient vegetable food. I have obtained the best results by limiting the quantity of nitrogenous food, especially in children, and by increasing the quantity of butter, cream, and fatty articles. I give light suppers, secure abundant sleep, and moderate exercise, especially in gymnastics. Treated in this way, but little medicine is required.

## INJURIES OF THE FŒTUS DURING LABOR.

BY THEOPHILUS PARVIN, M.D.

[Read October 26, 1887.]

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THOUGH injuries of the child during labor are not frequent, probably they are much less rare than commonly believed. In many instances they are not recognized immediately after delivery, and they may spontaneously disappear, and in some their consequences are attributed to erroneous causes.

Some of these lesions may happen in spontaneous labor, and others in artificial, whether the interference be manual or instrumental. It is impossible to classify them according to their causes, and apparently the most satisfactory division is one resting upon the regions or parts affected. Hence, in the paper now presented, injuries to the foetus in labor will be divided into those involving the head and neck, those of the trunk, and, finally, those of the extremities.

INJURIES OF THE HEAD AND NECK.—Contused wounds of the scalp and of the face, and incised, punctured, and lacerated wounds of the former are met with. So far as contused wounds of the face are concerned, it usually happens that they follow difficult delivery with the forceps, especially if the instrument be a powerful compressor; so too these result if the blades are applied obliquely, or antero-posteriorly to the head instead of to its sides. But in most all cases the effects are trivial and soon disappear. Punctured and incised wounds of the scalp have been made by the obstetrician mistaking a caput succedaneum for the foetal sac. Tarnier mentions an instance of a wound thus inflicted leading to the death of the child from erysipelas a few days after birth. More extraordinary is a lacerated wound of the scalp made in the effort to apply forceps, the operator introducing one of the blades between the scalp and the cranial bones. An example of this terrible blunder is mentioned by Charpentier, and I have met with a similar case.

Sloughing of a portion of the foetal scalp has been observed fol-

lowing some cases of spontaneous labor. Thus, Priestley<sup>1</sup> has reported a case of this kind, resulting in death eight days after delivery; the labor was protracted for forty-eight hours because of a narrowed pelvic outlet. Lizé,<sup>2</sup> of Mans, states that in the case of a multipara, forty years of age, the waters ruptured five days before the birth of her child, which presented by the vertex, but occupied an occipito-sacral position. Five days after delivery, a slough involving almost the entire extent of the occipital bone appeared; three days subsequently it became detached and the child recovered.

Bouchut<sup>3</sup> quotes from Lorain a case of gangrene of the scalp in a newborn child occurring in the service of Moreau at the Maternity. The mother was a primipara, and the labor lasted forty-eight hours, terminating spontaneously; the child died on the nineteenth day.

Dr. Goodell informs me of a case in which an oblique application of the forceps was made—one blade being in relation with the right frontal bone, and the other with the left occipital—and the right anterior portion of the head was so bruised that sloughing occurred a few days subsequent to birth; after the detachment of the slough a fatal hemorrhage occurred.

Depressions and fractures of the cranial bones, separation of their union to each other, fractures of the bones of the face, as well as disjunction of their articulations and joints, have been observed more or less frequently in cases of difficult labor, manual or instrumental—some of them, indeed, in spontaneous labor.

In regard to depressions of the bones of the foetal skull, some obstetricians have asserted that they are always accompanied by fractures. That was the opinion of Danyau, of Lachapelle, and of Schröder. But the following case,<sup>4</sup> given by Matthews Duncan, seems to strengthen the view held by most obstetricians, that such depressions may occur without the bone involved being broken. The case was one in which persistent digital impression was produced on the right parietal bone of a foetus during birth, by the finger of the accoucheur, who was endeavoring to cause rotation. The result was slight, short, but frequently repeated epileptiform seizures, which lasted some time after the digital impression had disappeared, and were finally replaced by choreic movements. Now it seems hardly probable that the pressure of the finger produced a fracture of the bone.

<sup>1</sup> London Obstetrical Society's Transactions, vol. i.

<sup>2</sup> Annales de Gynécologie, 1875.

<sup>3</sup> Traité Pratique des Maladies des Nouveau-Nés, etc.

<sup>4</sup> British Medical Journal, October 18, 1873.



Dugès<sup>1</sup> has given an instance of great depression in one of the parietal bones, not followed by any serious consequences. The child was delivered by the feet through a pelvis of which the conjugate was estimated at three inches and a quarter. Powerful traction upon the shoulders and upon the lower jaw was necessary to bring the head past the obstruction, and the parietal bone, which was in relation with the sacro-vertebral angle, presented a depression half an inch in depth and two inches in breadth. The infant was resuscitated with difficulty, then had convulsions, but in a few days was quite well, and in fifteen days the depression had entirely disappeared.

Minor depressions or indentations are sometimes seen, especially after the application of the forceps, and in rare instances such marks are permanent. But we must not be in haste to conclude that these indentations found upon the head of a newborn child are proofs of instrumental delivery, for Osiander<sup>2</sup> has stated that, having delivered a child by podalic version through a narrowed pelvis, he found upon its head a depression into which the end of a forceps-blade accurately fitted; so that he himself would have concluded, had he ever a similar depression, that the delivery had not been spontaneous, but by the forceps.

Fractures of the foetal skull have been observed as the result of direct violence, as when a woman expels her child while she is standing, and it falls on the floor. Or, again, a woman,<sup>3</sup> near the close of the second stage of labor, the child's head being at the vulvar opening, threw herself out of the window, and several fractures of her limbs, as well as a fracture of the child's head, resulted.

But apart from these cases in which the injury has resulted from direct violence, and those observed in delivery, whether spontaneous, manual, or instrumental, in narrowed pelves, which will be referred to in a moment, fracture may occur when the labor is in all respects perfectly normal, so far as duration and facility are concerned. Thus, Dr. Charles West<sup>4</sup> has reported the case of an infant dying from convulsions nine days after birth, the labor having been an easy one and lasting but five hours; the mother had previously given birth to two living children, and these labors too had been normal. Yet upon an autopsy of the third child, a fracture of the right parietal bone, with

<sup>1</sup> Quoted by Jacquemier, *Manual des Accouchements*. Paris, 1846.

<sup>2</sup> Given by Ciéslewicz, *Verletzungen des Fœtus durch den Geburtshelfer*. Halle, 1870. Ciéslewicz gives forty cases of fracture, fissure, contusion of nerves, laceration of muscles, separation of epiphyses, etc., occurring in labor; he also reports two of rupture of the longitudinal sinus.

<sup>3</sup> Quoted by Delore, *Fractures du Fœtus*, *Dictionnaire Encyclopédique des Sciences Médicales*.

<sup>4</sup> *Transactions of the London Medico-Chirurgical Society*, 1845.

effusion of blood between the cranium and dura mater, the effusion being more than half an inch thick and occupying the entire fossa of the bone, was discovered. He states in his report that fractures of the skull have been known to take place during easy labors, and wholly independent of any preternatural degree of ossification of the skull. Monteith<sup>1</sup> mentions having attended a case of perfectly natural labor, yet the child had a fracture of the right parietal bone; there was a marked depression in the middle of the bone, and the fracture extended to the sagittal suture on one side, and to the coronal on the other.

It is quite apparent that a case such as either of these might give rise to medico-legal investigation, or to unjust censure of the obstetrician.

Coming now to fractures of the bones of the cranium or face, or rupture of joints involving the maxillary symphysis, or the cervical vertebræ, or fracture of a vertebra, for it is claimed that usually the body of one is broken rather than a separation between two vertebræ, as the consequence of great traction occurring in manual or in instrumental delivery, an important question arises as to the amount of force that may be safely used either with hand or instrument. In illustration of the great force which has been employed in forceps delivery without injury to mother or child, I quote the following from Dr. Peugnet.<sup>2</sup> He states :

"I was called to Mrs. K., a multipara, in labor with her third child. The first two were delivered by craniotomy. The vertex presenting, R. O. A., and impacted between the sacrum and the pubes, the conjugate diameter of the superior strait greatly contracted, I applied forceps, and had great difficulty in locking them. Dreading the laceration which might ensue in this case from side-to-side lever action, I concluded to rely upon direct and steady traction. My strength giving way, her husband held me round the waist, whilst the patient was held *in situ* on the dorsum by four women. In forty-five minutes I had the satisfaction of bringing the head down upon the perineum. The delivery was then speedily accomplished. Both mother and child, did well."

The least that can be said in regard to this case is, that the result was very remarkable, and it is doubtful whether the practice pursued could be repeated in any considerable series of similar cases without injury to both mother and child.

Delore,<sup>3</sup> after remarking that the foetal head may endure, without injury, a great compressing force if applied to a large surface, and if

<sup>1</sup> London Lancet, November 14, 1874.

<sup>2</sup> Ohio Medical and Surgical Journal, 1878.

<sup>3</sup> Op. cit.

made by a regularly concave surface, as that of the blades of the forceps, states that from his experiments he found a compressing force of one hundred kilogrammes did not cause a fracture. But, on the other hand, if the blades slip, if the pressure is made upon a small surface, fracture follows the exercise of much less force. Further, a blunt, angular body, such as the sacro-vertebral angle, the spherical surface of which is described by a radius of two or three centimetres, produces a fracture with a force of twenty kilogrammes. As the force which is exerted in difficult labor is more than twenty kilogrammes, fracture results.

Nevertheless, these results are not in complete accord with those of Goodell,<sup>1</sup> though, as will be seen, he is discussing the question of the amount of force of traction that may be safely used in a narrowed pelvis without injury to the neck of the child. Nevertheless, the subject of injury to the bones of the head is also involved, and in only one instance, I believe, does he mention fracture of one of the cranial bones. He states that he has on several occasions delivered living children after throwing on their necks a weight of 130 pounds. He further says that, although exerting all the manual strength at his command, he has never seen the body part from the head; he mentions one instance in which there was not the slightest apparent injury to the neck though the sacral side of the head had been broken in. Further, in another case, the force of traction upon the child's head, combined with suprapubic pressure, amounted to 200 pounds. Stone<sup>2</sup> has more recently reported a case of podalic version, and delivery by traction through a narrowed inlet, in which he put on the neck of the child all the force of which he was capable, using the pump-handle movements described by Goodell. The child was dead. There was no fracture of the bones of the head.

"The spine had parted in the upper dorsal region during the traction upon the trunk, which was necessary to cause the shoulders to come low enough to reach the arms. The cervical spine was not broken."

Delore's conclusion as to the amount of force followed, in pelvic narrowing, by fracture of the cranium of the fœtus is erroneous, or such injury ought to have been observed in all the cases where a force even approaching 100 pounds were used.

Champetier's<sup>3</sup> investigations as to the force that could be safely used in the delivery of the fœtus, led him to the following con-

<sup>1</sup> American Journal of Obstetrics, 1875.

<sup>2</sup> Medical and Surgical Reporter, February, 1880.

<sup>3</sup> Du passage de la tête fœtale à travers le détroit supérieur rétréci du bassin.



clusions, the first of which does not correspond with the results obtained by Goodell: First, there is danger of fracturing one of the parietal bones, whatever the method of extraction, if the total force employed reaches thirty-five to forty kilogrammes, the infant being at term, twenty to twenty-two kilogrammes if it be premature. Second, the inferior maxillary of a child at term will bear, without rupture, a traction of twenty-five kilogrammes. Third, the vertebral column of an infant at term was ruptured in three cases by a force of fifty kilogrammes.

So far as objected that these results have been obtained by experiments upon dead children, and, therefore, they are not applicable to the force that may be exerted upon living ones, the answer of Matthews Duncan may be repeated. He, after consulting physiological and physical authorities, could say that a child living and one recently dead were the same as to tensile strength.

In this connection it is well to refer to the amount of traction which may be safely applied to the lower jaw of the fœtus, as stated by Duncan<sup>1</sup> from his own experiments. It will be observed that his results are not the same as those announced by Champetier. Duncan states:

"It is now ascertained that a force of half a hundred weight (fifty-six pounds) may, at least in some cases, be applied by dragging the lower jaw of the fœtus without producing any easily discovered injury of parts."

He further says that compound dislocation would be almost certainly fatal, and in one of his experiments this injury was done by a weight of fifty-six pounds.

Not only does Duncan's statement as to the force which the inferior maxillary will bear without injury differ from that of Champetier, but the difference is still greater from that given by Delore, who makes this forty kilogrammes.

Fractures of the cranium usually involve the parietal bones, but they may also occur in the frontal, in one of the temporals, or in the occipital. Jacquemier first pointed out the separation between the squamous and the basilar portion of the occipital bone, to which some more recent writers<sup>2</sup> have directed attention without giving him just credit. He has also stated that he met with fracture of the occipital in that part of the bone above the protuberance.

Ruge,<sup>3</sup> referring to separation of the epiphyses between the squamous

<sup>1</sup> London Obstetrical Society's Transactions, vol. xx.

<sup>2</sup> Thus Bednar, *Die Krankheiten der Neugeborenen und Säuglinge*, Wien, 1863, refers to it as a hitherto unobserved injury.

<sup>3</sup> *Bulletin de Thérapeutique*, from *Zeitschrift für Geburtshilfe und Frauenkrankheiten*, 1875.

portion of the occipital bone and the articular part, states that Schröder is the only one who has recently drawn attention to it, and, notwithstanding its importance in regard to the life of the child, this lesion is not referred to in classic works as one of the immediate consequences of extraction. The lesion may also occur in a narrowed pelvis, though the presentation be cranial. In these cases there may be not only effusion of blood, but further compression by the squamous portion having its anterior inferior margin forced against the medulla.

On the other hand, severe injury of the frontal bone has been observed without serious consequences. Thus, Dugès<sup>1</sup> saw a child recently delivered, and the left eye was almost completely outside the orbit, so great was the depression of the frontal bone, yet the infant did not have convulsions or any other grave symptoms.

I have, however, seen protrusion of the eyeball in a newborn, following fracture of the frontal bone by Hodge's forceps, used in a case of tedious labor in a primipara, the delay being from an occipito-sacral position; the child lived for a week after birth. That an infant may survive very grave injuries in labor is proved by a case reported by Lamotte,<sup>2</sup> in which a surgeon, in a case of shoulder presentation, had torn away the arm, and then performed craniotomy, evacuating a large amount of the cranial contents; yet the child was born alive.

Zweifel<sup>3</sup> regards fissures and fractures of the cranial bones as only of clinical significance if a sinus be injured and consequent hemorrhage occurs. On the other hand, Delore<sup>4</sup> asserts that all these fractures are grave, on the ground that they may be accompanied by contusions of the brain. Further, there may be hemorrhages between the bone and the periosteum, in the cavity of the arachnoid, or between the pia mater and the brain. If the solution of continuity be at the position of a sinus, there is frequently rupture of the vessel. He adds that in all cases in which the head has undergone severe compression from dystocia, he believes hemorrhages occur. The significance of this last remark will be appreciated, especially when we consider the remote consequences upon the mental condition of the child, as urged more especially by some English observers.

Injuries to the bones of the face are usually of the inferior maxillary. This bone may be fractured, or separation of the mental symphysis may occur. Ruge mentions cases in which, in addition to injury of the bone, there were lesions of the soft parts—as, for example, tearing

<sup>1</sup> Jacquemier, *op. cit.*

<sup>2</sup> *Lehrbuch der Geburtshülfe.*

<sup>3</sup> *Traité des Accouchements*, 1726.

<sup>4</sup> *Op. cit.*

of the skin at the angle of the mouth, as well as the mucous membrane of the pharynx and rupture of the genioglossus.

Yet if we fail to use traction upon the lower jaw in cases of difficult head-last labors, we miss what may prove an important means of delivery in some cases, and which may be of great value when other means fail. Some years ago, in a case of narrowing of the pelvic inlet, having failed to deliver with forceps, I performed podalic version, and sought to deliver by traction, while a consultant aided with suprapubic pressure. I am confident I did not use the force which some operators have safely employed under similar circumstances, yet the cervical vertebræ gave way, either by separation, or by fracture, and I found apparently nothing but the integument holding the head to the body. I then succeeded by traction upon the inferior maxilla, suprapubic pressure assisting, in bringing the head into the pelvic cavity.

That the head may be left in the uterus, the body being dragged away, is a fact proved by occasional instances in the history of obstetrics. In other cases the division has been made, not by rupture, but by cutting through the neck. An instance is reported<sup>1</sup> in which the obstetrician failing to deliver the head in a case of shoulder presentation, after detaching the arm and bringing down the feet, performed decollation, and the head and the placenta remained in the uterus forty days. Freund mentions a case in which the head was left in the uterus ten years.

Probably the most remarkable case of multiple injuries to the face has been recorded by Petit.<sup>2</sup> The face presented, rupture of the uterus occurred, and the woman died undelivered, though the forceps had been used. The autopsy of the child showed multiple separations of the bones of the face, and fractures.

Paralysis of one of the facial nerves has been observed most frequently, but not exclusively, after the use of the forceps. In a paper read before the American Gynecological Society in 1885, I have referred to eight cases of spontaneous facial hemiplegia, and also mention one case observed by Secligmüller, in which the paralysis affected both sides of the face. But the disorder usually occurs from the use of the forceps, and is caused by the pressure of one of the blades at the stylomastoid foramen, or a little in front of the lobe of the ear. Landouzy, who has best described the affection, has remarked that in the infant the complete absence of the mastoid

<sup>1</sup> *Obstetric Gazette*, from *Archiv für Gynäkol.*, March, 1883.

<sup>2</sup> *Annales de Gynécologie*, 1874.



apophysis, and the slight development of the auditory canal, favor the possibility of this compression of the faeial nerve near its point of emergence. In six weeks, according to Parrot and Troisier, recovery usually takes place in paralysis of the faeial caused by forceps. Many cases, however, are well in ten days. Nevertheless, while recovery is the rule, it should be remembered that in some the injury is permanent. Duchenne<sup>1</sup> refers to two patients, one fifteen years old, and the other five years and a half, in each of whom the paralysis continued.

It should also be observed that there may be facial paralysis in the newborn caused by protracted labor and intracranial hemorrhage. Injuries of the sterno-cleido-mastoid muscle have been observed by several. In reference to torticollis of obstetric origin, Stromeyer and Dieffenbach explained the affection as resulting from improper application of the forceps, the muscle being bruised or torn. Nevertheless, this explanation is rejected by Saint-Germain as not plausible. A very large proportion of infants that have wry-neck, are born with pelvic presentation, and it is asserted that in the traction exerted rupture of a greater or less number of the fibres of the muscles take place, and a hæmatoma follows; finally, the contractions of the cicatricial tissue result in drawing the head into its unnatural position. One of the first references to tumors of the sterno-cleido-mastoid was made by Melchiori<sup>2</sup> in 1862. He spoke of them as indurations of muscle, sometimes met with in young infants, and to which he found no reference in authors. He met with the disorder four times, and he described the affection as an indurated, plastic deposit; while he mentions temporary deformity of the neck, he does not speak of any case in which this was permanent. In referring to the etiology, he suggests that compression of the muscle or laceration of some of its fibres may take place during labor.

The next year both Dr. Wilks and Sir James Paget<sup>3</sup> met with cases of what they described as chronic induration of the sterno-cleido-mastoid. Another case of the affection was reported the same year by Harris, and thus the published cases in a few months were at least six, but no reference was made by any of the reporters to the previous observations of Melchiori.

Bryant<sup>4</sup> in 1863 reported two cases of thickening of the sterno-cleido-mastoid. One patient was four, the other eight weeks old when he saw them; in each instance the birth was with pelvic presentation.

<sup>1</sup> See Nadaud, *Des Paralysies Obstétricales des Nouveau-nés*.

<sup>2</sup> *Medical Times*, London, vol. ii., August 9, 1862.

<sup>3</sup> *London Lancet*, 1863, vol. i. pages 11, 236, and 313.

<sup>4</sup> *London Medical Times*.

Probably in all the cases, or at least in a majority of them, the disease was hæmatoma. Nevertheless, Blachez<sup>1</sup> regards these tumors as caused by an interstitial myositis in consequence of traction upon the muscle. He describes the tumor, observed in one of his patients, as elastic, almost painless, and the size of a pigeon's egg; it was situated in the right sterno-cleido-mastoid, and was not discovered until two or three weeks after birth, when the attention of the parents was called to it by the infant's keeping the head inclined to the right side.

Zweifel recognizes injuries of the sterno-mastoid muscle in labor as a cause of torticollis.

Professor Albert,<sup>2</sup> of Vienna, referring to a child with torticollis, stated that the sterno-cleido-mastoid may become contracted during intrauterine life, or be injured during birth. In breech presentations, and in difficult forceps delivery a laceration of this muscle may occur, and be followed by inflammation and contraction.

While such injury is more frequent after head-last labors, yet they are also met with in vertex presentations, and if the forceps has been used.

On October 2, 1861, a paper was presented to the London Obstetrical Society by Dr. Tyler Smith for Dr. W. J. Little, the title being "Upon the influence of abnormal parturition, difficult labors, premature birth, asphyxia neonatorum, on the mental and physical condition of the child, especially in relation to deformities."<sup>3</sup> In this paper, which by the way mentions two cases of wry-neck, that he attributed to difficult labors, the author says:

"It is impossible not to connect the persistent affections of the intellect, of volition, and of organic life, with the injury the several nervous centres suffered in some instances before the fœtus had reached the maternal pelvis, in others whilst in transit through it; and in a third set of cases, where the fœtus was exposed to neither of these kinds of injury, it suffered from asphyxia neonatorum, suspended animation, and its concomitant congestions, effusions, capillary apoplexies of the brain, medulla oblongata, and spinal cord."

Dr. Langdon Down, in discussing the obstetrical aspects of idiocy, stated that in a very large number of cases of idiocy the subjects were born after difficult labors, these being unusually tedious, and he held that if a neurotic tendency was present the tedious labor and suspended animation might determine the catastrophe, where otherwise all might have gone fairly well.

<sup>1</sup> Gazette Hebdom., May 19, 1876.

<sup>2</sup> Obstetric Gazette, September, 1882.

<sup>3</sup> Obstet. Society's Transactions, vol. xviii.

The following note from one of Dr. Little's<sup>1</sup> correspondents may be of some interest; it is in reference to a young man in regard to whom inquiry had been made by Dr. Little:

"I have again ascertained he was asphyxiated for two hours when born, and that he has always been a weak creature, very slow in mental development, with difficulty in speaking, trembling and shaky, unable to fix his attention on a book, and a bit of a punster."

The final statement, "a bit of a punster," is conclusive as to the intellectual feebleness of this unfortunate man!

These views are further strengthened by the statement of Dr. Arthur Mitchell<sup>2</sup> that he believes there is a connection between difficult labor and idiocy.

**INJURIES OF THE TRUNK.**—The chief lesions of the trunk are rupture of the connections between the dorsal vertebræ, or fracture of one of these, injuries to the abdominal wall by a badly directed blunt hook, effusion of blood in muscles, similar to those that have been referred to as occurring in the sterno-cleido-mastoid, retropleural hemorrhages along the spinal column in case rupture of this column occurs, hemorrhage into the abdominal or thoracic cavity, and collections of blood beneath the capsule of the liver, or of the kidneys, and rupture of the sacro-iliac joint. Ruge has collected forty-four cases of injuries to the fœtus occurring in extraction after version, and twenty-nine of injuries in pelvic presentations; in the former there are three of rupture of the sacro-iliac joint. It is probable, as suggested by Zweifel, that some cases of ankylosis affecting this joint, of which the etiology is obscure, are to be attributed to injury in birth.

Zillner<sup>3</sup> has reported a rupture of the sigmoid flexure occurring in labor.

**INJURIES OF THE ARMS.**—In connection with these lesions those of the scapula and clavicle, which belong to the arms rather than to the trunk, will be considered. Delore states that fractures of the humerus are more frequent than all others; since they are usually readily cured, and are generally caused by *maladresse*, they are rarely published. But he further says that this accident may occur in the hands of the most expert accoucheur if the pelvis be contracted. They most frequently occur in the disengagement of the arms after podalic version when extraction is necessary, and they may also happen in pelvic presentation, but usually, if we do not have to extract the child—that is, if the expulsion can be left solely to nature—the arms will not

<sup>1</sup> Obstetrical Transactions, vol. iii.  
Centralblatt für Gynäkol., 1885.

<sup>2</sup> Medical Times, 1862, 1863.



ascend, but remain applied to the chest. Smellie<sup>1</sup> states that he fractured the humerus in a case in which he turned and delivered by the feet, and this is the only one he gives, while he mentions three cases of fracture of the femur, two occurring in the practice of his assistants, and one in his own.

All obstetricians agree that in bringing down an ascended arm it is important no pressure be made until the internal angle of the elbow is reached, and that three or four fingers should be employed, and not one or two. Pajot regards it as important that the posterior arm should be liberated first. Küstner<sup>2</sup> describes separation of the epiphysis of the head of the humerus from the diaphysis as one of the injuries of labor which may be overlooked, or falsely regarded as a luxation, fracture of the neck of the scapula, or injury to nerves. Fractures of the clavicle, separation from its sternal attachment, transverse fracture of the scapula, separation of the epiphysis of the neck of the scapula, injury of the acromion process, and dislocation of the humerus, have been observed.

Fracture of the clavicle is most frequently caused by pressing directly with one or two fingers in the endeavor to bring the head through the pelvic inlet after podalic version, or in pelvic presentation. McClintock, in one of his annotations to the Sydenham Society's edition of "Smellie," observes, "Although Smellie gives no example of fracture of the child's clavicle during delivery by the pelvic extremities, yet, in my experience, it is a bone very apt to be broken by the manipulations of the accoucheur, more so even than the humerus; this may, perhaps, be explained by its greater degree of ossification."

PARALYSIS OF THE ARM.—Sinkler recognizes hemiplegia as, in some cases, the consequence of injury at the time of birth, either from the forceps or from the pressure of a prolonged labor. Nadaud gives seven cases of paralysis of the arm attributed to the forceps; the first one of this injury reported is one of Smellie's. Jacquemier mentions an instance of paralysis of the deltoid following a long and difficult,

<sup>1</sup> Sydenham Society's edition of Smellie's *Midwifery*, vol. iii. pp. 296, 297. This great obstetrician, in the first volume, *op. cit.*, remarks: "In laborious or preternatural cases, when considerable force hath been used in delivering the child, the whole body ought to be examined, and if there is any mark or contusion on the head it will disappear if anointed with pomatum, and gently rubbed off or chafed with the accoucheur's hand; if any limb is dislocated or broken, it ought to be reduced immediately; luxations, though they seldom happen, are more incident to the shoulder than to any other part, the humerus being easily dislocated, and as easily reduced. The bones of the arm and thigh are more subject to fracture than any other of the extremities; the first is easily cured, because the arm can be kept from being moved, but a fracture of the thigh-bone is a much more troublesome case, because over and above the difficulty of keeping the bones in a proper situation, the part is often necessarily moved in cleaning the child."

<sup>2</sup> Ueber die Verletzungen der Extremitäten des Kindes.

but spontaneous, labor; the recovery was complete in fifteen or twenty days. He attributed the disorder to compression of the axillary nerve against the humerus at the point of its attachment to the deep face of the deltoid. Fasbender found a tumor, as large as a pigeon's egg, situated above the right clavicle, in an infant soon after delivery; the hæmatoma gradually disappeared, but at first there was paralysis caused by nerve compression. Delore suggests that paralysis may be caused by the rupture of a nerve trunk near its connection with the spinal cord. He states that this accident is not rare in the newborn or in young infants as a consequence of traumatism; it is followed by incurable paralysis, which is compatible with life if an upper member only is affected.

Disengagement of the extended arms in pelvic deliveries, traction upon the axilla in delayed delivery of the body in vertex presentation, the traction in some cases being with the blunt hook, in others with the finger, have resulted in paralysis of the arm. So, too, the same disability has followed a case in which the arm has protruded in shoulder presentation, and delivery effected by podalic version.

Luxation of the humerus has, in some instances, been mistaken for obstetric paralysis. Further, it is important to distinguish between cerebral and traumatic paralysis. Duchenne<sup>1</sup> gives an instance in which there were both cerebral and obstetric paralysis, the latter consequent upon a fracture of the ulna near the elbow.

INJURIES OF THE LEGS.—Fractures of the femur may be spontaneous, or consequent upon artificial delivery. Meyer has recently<sup>2</sup> reported two cases in which spontaneous fracture of the femur was observed; in one a single femur was broken, but in the other both femurs. In May, 1847, Dr. Vanderveer<sup>3</sup> reported a case of such fracture in childbirth.

But probably more fractures of the femur are to be attributed to the attempt to pull down a lower limb in pelvic presentation when the presenting part is already partially in the mother's pelvis, before pressing up that presenting part, or from the use of the blunt hook. Delore's experiments show that with the untired finger traction to the amount of fifteen kilogrammes may be made upon the groin, and this cannot break the femur. If a force of fifty-five kilogrammes is employed upon the femur, fracture occurs; if the instrument be perpendicular to the bone, the latter gives way with a pressure of twenty kilogrammes.

Again, the bone has been broken, or that which is equivalent,

<sup>1</sup> See Nadaud, *op. cit.*

<sup>2</sup> Archiv f. Gynäkol.

<sup>3</sup> New York Medical Journal.

separation of the epiphyses been caused from traction upon the leg. A. R. Simpson mentions an instance in which, podalic version having been performed, the right lower limb brought down, and traction made, subsequent examination showed that there were three such fractures.<sup>1</sup>

Luxations of the femur consequent upon obstetric operations, according to Ruge, are exceedingly rare; upon 300 autopsies of newborn infants he did not find a single true dislocation of this bone.

Küstner, in referring to luxations of the hip, speaks as follows:

“Göschel relates a case in which Langenbeck reduced such luxation after the subject, a girl, was thirteen years old, and mentions in this connection that Stromeyer had met with twenty cases. The only possible way in which this injury could occur would be by sudden and violent force drawing down the limb, and then dislocation upon the ilium might result. But the force must be great. I have suspended to the leg of a child, from six to ten minutes, a weight of from thirty to forty kilogrammes, without any injury to the joint.”

Complete paraplegia in connection with facial paralysis of the right side has been observed following a difficult labor in which the forceps was used. Examples of rupture of the spinal cord, in connection with rupture of a vertebra, have been observed, and, of course, paralysis of the lower limbs. It is remarkable that in two such cases the children lived for some hours. Paraplegia in the newborn is, as Nadaud states, usually an evidence of serious lesion of the cerebro-spinal organs, and the child dies after a short time.

I think the study of these cases of obstetric injuries, which might be greatly extended—for much more remains unsaid than has been said—ought, in the first place, to lead us to a larger charity for fellow-practitioners, as many of the most serious injuries in childbirth may occur without the slightest blame necessarily attaching to the accoucheur.

Another lesson is that an important distinction should be made, as urged by Ruge, between podalic version and extraction, never resorting to the latter, unless absolutely necessary, after the performance of the former, and thereby many of the obstetric lesions of the fœtus may be avoided. Very wisely, Lamotte says, referring to the injuries that may be done in labor to the child by the accoucheur, “The hand improperly used is more dangerous than any instrument.”

Again, the question arises as to the safest manual means for the delivery of the head in head-last labors. In Cieslewicz's collection of

<sup>1</sup> Edinburgh Med. Journ., 1880.



cases of injuries of the fœtus in labor, there are several in which very serious consequences resulted from employing the Prague method. One of these, reported by Gusserow, showed, upon post-mortem examination, rupture of the vertebræ and most of the soft parts of the neck so complete that the head was attached to the trunk only by the skin and the vertebral arteries. Ruge, rejecting both the Prague and the Vienna method, prefers elevation of the occiput, bringing the face down, and carefully conducted expression, as least liable to injure the fœtus.

Another question of practical interest, is the best method of delivery in pelvic presentations, when interference is necessary. Should we follow that employed by Goodell, in all cases bringing down a foot as soon as possible, and thus be commander of the situation, in case necessity for extraction arises? Must we use the blunt hook? Is the application of the forceps to the breech to be generally advised?

Again, while treatment of fractures of an upper limb, or of the clavicle, is said to present usually no great difficulty, can a similar statement be made as to fracture of the femur? What method of treatment is best?

In depressed fractures of the skull, is it not probable that some lives might be saved by the use of the trephine? and in other cases, not followed by death, perfect mental integrity insured?

Finally, many questions as to the diagnosis of obstetric paralyses of the newborn arise, and, also, as to when and what treatment should be employed.

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## DISCUSSION.

DR. W. T. LUSK, of New York, said: Dr. Parvin, in his exhaustive *résumé* of the subject, has said that we should exercise charity toward those under whose care these accidents may happen. At the same time I think we should, as scientific men, look upon this record as most humiliating, and should ask ourselves if we should exercise this charity toward ourselves as individuals, should these accidents fall to our lot.

I wish to avoid a repetition of the points which have been already so ably presented. In going over the subject there may, however, be found one or two matters which have been overlooked, or which it might be well to make more emphatic. In speaking of fractures of the skull occurring in spontaneous deliveries, cases which occurred many years ago have been given. In modern times reports of fractures in head-presentations terminating without the intervention of art are very rare. My attention has been called to one

such case reported by Veit. The patient had received large doses of ergot. When the child was expelled it was found that the right parietal bone was separated from its fellow, from the occipital, and, to a great extent, from the frontal bone, and two fractures were found in the bone itself. It is a question, whether the cases of spontaneous fracture reported many years ago were due to the abuse of this certainly most unreliable drug?

I saw last summer a very interesting case of depression of the skull following a rather easy forceps delivery. I was sent for because the question had arisen between two practitioners as to the advisability of trephining the skull—introducing an instrument and elevating the depressed bone. I am not sure that this might not be good practice in some instances, but so far we have had no experience as regards results. We know that if the child shows no immediate symptoms from the depression, it is likely to thrive, and that in time the depression nearly or entirely disappears. In the case above referred to we decided to wait; the child has been thriving since, there is still a quadrilateral depression in the frontal region which has not entirely disappeared. I was quite certain that the mother of this child had a contracted pelvis with projection of the promontory; but, on making an examination some three or four weeks after the birth of the child, to my surprise, found that the woman had a fairly roomy pelvis. The antero-posterior diameter measured at least three and three-fourths inches. The only conceivable cause of the depression was the blade of the forceps. This was to me certainly a novelty.

With reference to the amount of force which may be exerted on the neck of the child, I think that if we rely upon the experiments to which reference has been made, we are likely to be led into error. There is no doubt that the resistance of the neck under pressure varies greatly in different subjects. While the neck of one child will bear a weight of 160 pounds, the vertebrae of another will separate under a much less amount of tension. I do not believe that there are even circumstances in which such an enormous pressure as 160 pounds should be exerted. If the after-coming head is retained by tonic retraction of the womb, such traction force must tear through the cervical tissues. If the head is retained by the brim of the pelvis, it is nearly certain that the child will be stillborn when the necessity for such an amount of force exists. It is a question whether we ever should use much force in pulling on the child? Whether, indeed, the head cannot better be shoved through the pelvis by supra-pubic pressure, in the manner described by Dr. Goodell and Dr. Taylor.

There is one injury to the child which I do not think was particularly referred to by the author. He spoke of the dislocation of the occipital bone which sometimes occurs. In the case of a flattened pelvis, where the head enters in the transverse diameter, it will sometimes happen, where forceps are used, that the pressure of the blades bears directly upon the forehead and upon the occiput. This will be tolerated for a certain length of time, but, when continued, the pressure ultimately affects the medulla oblongata. It is then difficult to get the child to breathe, the respiratory sense being destroyed, and often the child is born dead, as the result of such pressure. It is always well to be careful that, when the blades of the forceps cannot be applied to the sides of the head, they are applied in the oblique diameter.

With reference to fracture of the clavicle, it sometimes happens that this

injury is due to direct pressure; more frequently, according to Ruge, it is due to the introduction of the hand into the vagina to bring down an extended arm. If the pelvis is small, the vagina rigid, and there is insufficient room for the hand, as the result of pressure upon the shoulder, the clavicle is apt to bend like a bow, and break in the middle.

In a well-conducted labor, the arms should not become extended above the head. In cases where this does take place, we know the directions that are given to draw on the elbow and push the arm over the face, but where the space is small you cannot always press the arm around the front of the face in the limited time required to extract the child alive. In these cases I think that we are justified in breaking the arm to accomplish delivery. Cases of true dislocation are probably exceedingly rare, at least we have no evidence of cases where the lesion has been demonstrated by dissection, but separation of the epiphysis closely resembles dislocation backward or forward, and until dissections were made, dislocation was considered a common accident. There are one or two points in regard to separation of the epiphysis that are of interest. As a consequence of this fracture, Küstner has shown, that the cartilaginous portion of the bone is rotated outward by the action of the infra- and supra-spinatus and the teres minor muscles, while the shaft of the bone is rotated inward by the pectoral muscle, the latissimus dorsi, and the teres major. If the position of the arm is not rectified and union is allowed to take place, the movements of the arm will be more or less affected. Both external and internal rotation can then be accomplished only to a slight extent. Separation of the epiphyseal end of the humerus closely simulates paralysis, and some recent writers have gone so far as to assert that all cases of supposed paralysis of the arm are really cases of this injury. This is, however, not always the case. Last summer I attended an excitable primipara, who early in labor passed into a maniacal condition which necessitated keeping her under an anæsthetic. After the chloroform had been kept up for two or three hours, the cervix was partly dilated, and not wishing to continue the chloroform, for the immunity which attends its use in labor does not apply to its prolonged administration, I put on the forceps before dilatation was complete, and with considerable difficulty extracted the head through the cervix, the vagina, and through the vulva. The perineum did not tear, but the moment the head escaped, the vaginal orifice closed down tightly on the neck of the child, and I was compelled to introduce two fingers into each axilla to complete the delivery. After the birth one arm was found to be paralyzed. As I knew these have been recently asserted to be cases of epiphyseal separation, I examined the arm with great care, but failed to find the slightest evidence of fracture. There was no pain. There were no evidences of brain disturbance, although the pressure of the forceps had been continued for a long time. The galvanic current was applied to the arm, frictions were employed and it was kept warm, and in about ten weeks the child began to move its arm, though recovery is still far from complete.

To pass over the other points referred to, I should like to say a few words in regard to extraction in breech cases. It is nearly impossible where the arm has been bent behind the neck of the child to extract the arm without fracture. Then why not fracture the arm? Is the physician responsible if this accident occurs as the result of efforts to release the member? I should say,



no; but he is responsible for the displacement of the arm behind the head. If he leaves the body alone and does not twist the trunk, the arm will not remain extended. The child does not spontaneously flex its arm and place the forearm underneath the occiput.

There is a case recently reported by Englebach which I would add to the list of accidents. In this case the child was born with an enormous swelling of the scrotum, due to an effusion of blood into the tunica vaginalis of each side.

I have taken some interest in the questions connected with the extraction of the breech when both extremities were reflected upward, and I wish to reiterate what I said two or three years ago with reference to the use of forceps to the breech. In a recent brochure Küstner condemns this method, but confesses to have never tried it. We all know that in the exercise of the usual method, a person with strong fingers is capable of exerting a great deal of force which bears to a great extent on the sacro-iliac synchondroses, and under these circumstances rupture of the sacro-iliac joint is likely to take place—a rupture which may be followed in after life by the development of the Nægelé deformity. I think that the application of the forceps to the breech is easier than a person who has not tried it would suppose. I speak of cases where the breech has reached the floor of the pelvis. Here it is not necessary to use a great deal of force. If the breech is brought down to the perineum and then allowed to recede, and this is continued until physiological softening of the pelvic floor and perineum takes place, a very moderate degree of force is required. I think that the use of the forceps under these circumstances is attended with less risk to the child than the employment of the fingers or the blunt hook. I have succeeded with the forceps in three cases where the fingers had been used in vain.

I do not feel like occupying any more of the time of the Society. I would say, in conclusion, that this is a subject to which too much attention cannot be given, for woman after passing through the discomforts of the period of gestation, and the perils of labor, is entitled to the only reward that it is possible to give her, that of having a living child, sound in body and limb; and anything that will contribute toward the prevention of such a record as we have heard to-night is certainly worthy of the attention of any body of scientific men. At the present time the public hold us responsible if we allow a patient to die of puerperal fever. It would probably intensify our interest in the subject if the public were to take a similar position with reference to dead and injured children.

DR. E. WILSON said: I have been much interested in, and instructed by, the paper of the evening. I was glad to hear the last speaker condemn the use of great force in the delivery of the child by forceps, or by traction in cases of breech presentation. With reference to the application of the forceps to the breech, I can only say that I have participated in but one case where such application was made. This was a case of first labor, and the physician had applied the forceps to the breech on the supposition that it was the head. As the labor was progressing satisfactorily and safely, cautious traction was made with the forceps, and the labor terminated without injury to the mother or the child.

DR. H. LEAMAN said: I think that the presentation of this subject has

been opportune. I believe that we are entering upon a new period with reference to the subject of labor. We are passing out of the instrumental, or what may be called the obstetric period. We are passing into the gynecological period, which is essentially physiological. The careful studies of gynecologists have forced upon obstetricians the careful use of instruments.

Some of the injuries referred to to-night I have seen. In my early practice I was unfortunate enough to fracture the inferior maxilla, but that has been the only case in a practice of twenty years. I have seen the clavicle broken, and I have seen paralysis. I recently had a case of facial paralysis, which was due to the fact that the sacrum was greatly curved, the coccyx being movable. The presentation was vertex left front, but the head was held from complete rotation by the deep curvature of the sacrum. This was overcome without difficulty by the application of the forceps. The instrument was then removed, and the labor allowed to proceed. The caput succedaneum was on the right parietal region, while the paralysis was on the left side. This passed off in the course of six weeks.

The injuries referred to are rare, and I believe have been necessary in the course of events. It is to be hoped that they may in great measure be prevented in the future. There is one injury not mentioned, which I am satisfied exists to a greater extent than any already referred to. I believe that too much haste in delivery, and in tying the cord, often causes non-closure of the foramen ovale. The whole idea in the instrumental, or obstetric, period has been to get the child out. I have made a number of post-mortems in the case of children, and I have found the foramen ovale open too frequently. Many of the nutritive diseases of childhood are doubtless due to malnutrition resulting from a persistent foramen ovale.

DR. WHARTON SINKLER said: A very large proportion of the cases of paralysis that I have met with in infants, have followed instrumental or prolonged and difficult labors. The most frequent form that we meet with is facial paralysis, either unilateral or bilateral. This generally results from the pressure of the forceps upon the facial nerve or upon the mastoid process. Facial paralysis may, however, result simply from the impaction of the child's head in the pelvis without the use of the forceps.

Hemiplegias are often met with in the newly born as a result of the use of the forceps. A few days ago I saw a child with right hemiplegia, and the mother stated that the child had been delivered by forceps, and that immediately after birth there was a deep depression behind the left ear. I found upon examination of this child, who was now sixteen months old, that a depression still existed in the left mastoid process. There was right hemiplegia present. The right leg was spastic and the movements of the arm limited and incoördinate. Spastic paralysis and what is sometimes called double spastic hemiplegia very frequently occur in children who have been born by the breech. These conditions generally persist during life and are associated with a feeble condition of the intellect.

Professor Parvin has referred to injuries to the sterno-cleido-mastoid muscle. I have seen cases where the child had lost power in all the muscles of the neck, so that it was unable to support the head. Some of the cases have been delivered by the breech and considerable traction made. Some have followed delivery by forceps perhaps from pressure on the spinal accessory nerve, or

perhaps from extravasation of blood. In the case of paralysis following difficult or instrumental labors, the lesion is often an extravasation of blood over the motor convolutions, a meningeal hemorrhage. If the amount of the extravasation is great, the prognosis is, of course, bad; but in some of the cases, especially where there is monoplegia, where there is paralysis of one arm alone, the child entirely recovers the use of the limb; and in facial paralysis recovery, as a rule, occurs in a few days, but the condition may persist during life.

DR. C. B. NANCREDE said: I believe the treatment of the injuries of the soft parts is too often left to the nurse, who either does nothing, or does that which ought not to be done. It has been recently shown that even the slightest injury of the scalp may end in periostitis, inflammation of the sinuses, meningitis, encephalitis, and often pyæmia. The prompt carrying out of antiseptic precautions greatly reduces the mortality from such injuries. Although in these cases certain forms of antiseptic dressing may be impossible, the principle of antiseptics is easily carried out in many ways. Here, of course, the Lister dressing, or the application of any irritant or poisonous substance is out of the question. But we may use boric acid freely, and it has the especial advantage of being a dry dressing.

Depression of portions of the bones of the skull, without fracture, is readily understood when we study the anatomy of the bones usually broken, viz., the parietal, frontal, occipital, and squamous plate of the temporal. Ossification proceeds from the centre in ray-like projections of bony fibre which, near the free edges of the bone, readily admit of various new relations to one another, without actual rupture of the osseous fibres. I believe, however, that fractures are more common than is generally supposed; but that they are not noted because the break is usually a simple fissure, or because it is concealed by a marked "caput" or cephalhæmatoma, since such injuries are usually met with after hard or instrumental labors. I would call attention to the fact that simple fracture of the skull is in itself of no consequence. The injuries to be feared are those done at the same time to the subjacent tissues by the force which produces the fracture. If I should ever see a case in which I was convinced that existing paralysis was due to depression I might trephine. The recently published statistics that seem to indicate that trephining under antiseptic precautions is entirely without danger are not to be relied on, and while I am a thorough believer in antiseptics I must call attention to the fact that as inflammation of the membranes or brain may occur from injury without any break of the cutaneous surface whatever, you certainly may have the same after, and because of trephining, despite antiseptics. Trephining cannot remove many of the conditions referred to by Dr. Sinkler, which are the real sources of danger, such as effusion of blood upon the surface of the brain or in the arachnoid. Fractures producing epileptic seizures, etc., later in life, are rough fractures where projecting spiculæ or rough edges impinge on the brain or membranes; and such fractures—except perhaps, *very rarely*, projecting rough edges—cannot occur in the infant skull; which is *devoid of* an internal table, from the shattering of which, in fractures in adults, secondary nerve trouble results. In the skull at birth, the articular eminence, which keeps a dislocated adult jaw from returning to its normal position, is practically absent; so that a dislocation of the jaw cannot be pro-



duced unless the force is sufficient to tear the soft tissues surrounding the articulation, giving rise to a compound dislocation. If the force applied is less than this, as soon as its application is suspended, the jaw returns to its normal position.

I believe that fracture of the long bones during labor is not very common, but that separation of their epiphyses is, for their union with the shaft is effected at this time only by the periosteum and soft cartilage. It has been shown that a few pounds weight exerting cross-strain will cause the separation, while six times the weight applied by direct traction will produce no injury. I do not believe that the injuries reported as dislocations were dislocations; but were separations of the neighboring epiphyses or pathological displacements. Any one who is accustomed to dissect the body of the newborn child knows how readily such separations are produced. No one has ever been able to produce a luxation in an infant's cadaver, because of this ease of separation of the epiphyses. Dr. Lusk has described a case of separation of the upper epiphysis of the humerus, which produced a peculiar displacement. Probably in this case all the epiphyses of the proximal end were together separated from the shaft. I would advise, in the reduction of a similar case, the method proposed by Dr. Moore, of Rochester. In the treatment of fractures of the foetal humerus, a friend of mine has had good success by fixing the whole upper extremity with a moulded splint in a straight position. Fractures of the femur are more difficult to manage. Here sheet vulcanite which can, by softening in hot water, be accurately moulded to the limb, had better be used; because it will absorb neither urine nor feces. An anterior splint should be made which will extend well up over the abdomen, and a posterior splint to reach from the buttock well below the knee, thus fulfilling the important indication of fixing the joints above and below the fracture. It requires only ten or twelve days for firm union to occur.

In speaking of torticollis the sterno-cleido-mastoid muscle has alone been referred to. It is possible that in some cases this is the only muscle at fault, but in most instances several other muscles, as the trapezius and scalenes, are involved. I have seen instances of injuries to this muscle in the newly born, but have never traced the cases in later life. Again, in a recently treated case of so-called congenital wry-neck, absolutely no history of injury during labor could be elicited.

DR. W. GOODELL said: I present for inspection this evening a specimen of firmly united fracture of an infant's humerus, of which I am not ashamed, but rather proud; for by the fracture I saved the child's life. It was a case of breech presentation, where the heart's action was failing and the ominous convulsive movements of the child were giving out, which indicates the near approach of death. The arm was up alongside the child's head, and if I had had more time, I could have brought it down without injury; but every second was precious. So I snapped the arm, and quickly delivered a living child. It died a few months afterward of cholera infantum, and the mother, knowing my interest in the case, allowed me to obtain the specimen. I have reported elsewhere a unique case, where fracture was produced by the maternal forces. The vertex presented, the pains were strong, the passages ample; but the head did not descend. Suddenly, during a very severe pain, a hand shot out of the anus, without tearing the perineum. While I was gazing on in

amazement, another pain suddenly took place. There was an audible snap, the hand as quickly disappeared from the anus, and the child was born with a fracture of the clavicle. The rent in the vagina was sewed up, and the fracture dressed with adhesive strips. The vaginal wound healed up perfectly, and the child recovered without deformity. This remarkable accident I attribute to the arm being thrown across the nucha. The protruding hand perforated the vagina, and was button-holed there. Then the advancing body forcibly dragged the arm down the back of the child, and the clavicle was fractured by the twist or strain it got.

In a case seen with my friend, Dr. James F. Wilson, fracture of the clavicle, and of the skull also, occurred. It was an exceedingly difficult case. She was delivered in her first labor by craniotomy, by Dr. Wilson, in conjunction with the late Dr. Parry. In this, her second labor, after using the forceps ineffectually, we turned, and delivered in a very few minutes, by vigorous traction and by very great pressure from above. The fractures were caused by the projection of the sacro-iliac promontory. The child recovered perfectly.

I have repeatedly seen facial paralysis; but in instrumental labors it has occurred only when the blades of the forceps were not applied exactly to the sides of the child's head. Dr. Parvin speaks of the child living a few hours after the performance of craniotomy. It was to such an occurrence that we owe the travels of Mungo Park, who was a physician, but who, early in his professional career, was so disgusted by this accident that he gave up practice. In his case the infant lived to manhood. With regard to head-last labors, I have tried to deliver the breech by the use of the forceps on the buttocks, and have succeeded with them, but they are liable to slip off. I therefore always bring a leg down in breech cases, and then I have command of the situation. The force of traction which the neck will bear is uncertain, and doubtless varies greatly: but I believe that the man who, in trying to save the child, breaks the most necks, saves the most children, and I respect him accordingly. Such labors are always very dangerous to the child; the percentage of deaths is a very large one. I look on a child in breech presentation as a child drowning, to which help must be sped—help at all hazards. It is emphatically a case of "neck or nothing," and we must not sacrifice the life of the child to any sentimental considerations about breaking its neck.

One point that perhaps does not come strictly under injuries to the fœtus, but may be considered here, since it causes the death of the fœtus, is pressure on the cord, prolapsed or wound round the neck, by one of the blades of the forceps, and especially by the occipital one, when the blades are not applied exactly to the sides of the head. I am sure this has occurred at my hands. An annoyance in cases of face presentation is the subsequent unnatural position of the child, which for days will lie with its head greatly extended, though it ultimately takes the natural position.

DR. D. LONGAKER said: I wish to speak of injuries to the soft parts of the head, from application of the forceps and pelvic deformities. I have reported a case where, after premature delivery with the Tarnier forceps, through a rachitic pelvis with a conjugate diameter of three inches, there was a rather clean-cut contused wound in the left anterior parietal region, which I am morally certain was not made by the extremities of the forceps, but occurred when the head suddenly slipped through the narrowed conjugate diameter.

Then there are wounds caused by faulty construction of the forceps, particularly an excessive cephalic curve, which brings the distal extremity of the blades into close apposition. I have seen one cut, and several severe bruises, produced in this way. A peculiar parchment-like condition of the bones of the foetal head is sometimes observed, especially of the parietal bones; and I have seen it so marked that I was able to diagnose it through the abdominal walls, but have never known it to lead to fracture. Fracture of the long bones has only occurred in my experience where the difficulties to delivery of a living child have been insurmountable. I have seen one case of separation of the epiphyses of the humerus, in a very large child, which was dead when delivered; and I have had one fracture of the femur from the application of the fillet, this being also a difficult delivery of a dead child. I fully agree with Dr. Leaman as to the injury of tying the cord too soon. The researches of Budin have fully shown this. I think we ought to lay down the definite rule, that the cord should never be tied until flabby, pale, and pulseless. It has happened to me also to compress a loop of the cord in the application of the forceps. I am glad to learn that Dr. Goodell succeeds in converting face into vertex presentations, by introduction of the hand; but if we fail in this we have produced an early rupture of the membranes with all its undesirable effects. For this reason the method of Schatz, of Rostock, is to be preferred.

DR. B. LEE said: The class of cases which has been discussed in so interesting and instructive a manner this evening, reminds me of the freshman's speech. "It was a good speech, but it was spoiled in the delivery." In my own especial line of practice, I must confess I have been astonished to find how few children I have been called upon to treat who have been thus "spoiled in the delivery." Certainly there are very few cases of hemiplegia or paraplegia as they come to the orthopædist, which can be traced back to injury received at the time of birth. When I speak of the orthopædist, I do not mean a physician who has frequent opportunities of seeing infants within a week of birth, but one whose patients come to him ordinarily at five or six years of age. The rarity of these instances of "spoiled children," in my own experience, may be due to the fact alluded to by a previous speaker, that the foetus is simply a gelatinous mass, and, therefore, little susceptible of injury; but I have been rather inclined to attribute it to the prudence, skill, and caution of my friends the obstetricians. I am entirely in accord with the opinion already expressed, that when lesions of the nervous system can be traced back to parturition, they are irritative rather than paralytic in their character—of the nature of spastic paralysis, or spastic contractions. Such cases are usually incurable, and generally accompanied by a certain degree of mental deficiency. But I believe that the majority of these children are either so completely spoiled that no doctor ever has a chance to do anything for them afterward, or that the lesions are transient, as in facial paralysis, and are entirely recovered from in infancy.

In the little Yankee town in which the distinguished guest of the evening and I played together as boys, there used to be a slang phrase in vogue among the boys, which I doubt not he will remember—"Push, and if you can't push, pull," indicating, in a rude way, the fact that force may often be exerted more effectively by pressure than by traction. Now, if I might venture to leave a thought with the obstetricians present, it would be that they should



depend less upon "pulling," and rely more upon nature's plan in the expulsion of the fetus—"pushing," or pressure.

DR. H. C. WOOD said: It has been eleven years since I attended a case of obstetrics, for which I trust I am duly thankful; and I should not presume to take part in this discussion, had not the remarks of the last speaker been so entirely contrary to my own experience. We do not see hemiplegias and paraplegias due to injury during labor, in children of five or six years, simply because children so injured never live that long. What we do see are the cases of spastic paralysis. Spastic paralysis is the secondary effect of an earlier destructive lesion, the immediate evidences of which may have been entirely overlooked. In all such cases presenting at my clinic I inquire as to the history of the labor; and invariably find that it has been unusually severe or instrumental. The brain at birth is so soft, so liable to injury, that while I would not have the obstetrician entirely discard the use of the forceps, I think he should never take them in his hand without bearing in mind the possibility that they will do serious permanent injury to the nerve centres of the child.

DR. W. H. PARISH said: Though Dr. Wood is no obstetrician, he talks like a very sensible one. I believe the forceps in proper hands save the lives of many children; but where improperly used they sacrifice not infrequently the child's life and often lead to subsequent harm. Their application at the superior strait is, under some conditions, exceedingly dangerous to the child.

Last year I saw a laceration of the child's perineum extending from the vulvar orifice clear through to the rectum, produced evidently by the tip of one blade of the forceps, which the practitioner had attempted to apply to an unrecognized breech presentation.

I recall the case of a robust Irish woman at the Blockley hospital, who had borne five or six healthy children. Labor was delayed, and ergot was freely and, of course, improperly given in my absence, until the contractions came on with unusual force. The child was speedily delivered, but died in a few minutes. At the autopsy I found that the principal lesion was a separation of the lateral, or articular, segment of the occipital bone, which was pressed in upon the medulla; doubtless by the excessive contractions produced by ergot. Recently a friend of mine saw in consultation a child, which, having presented by the breech and the scrotum become considerably distended from œdema; the medical attendant, mistaking the scrotum for the bag of waters, had cut it open and cut into the testicle.

DR. J. PRICE said: I desire to call attention to the fact that the "Simpson forceps" probably makes less compression of the head than any other form in use. As to the frequency of separation of the head and trunk, by traction in head-last labors, I might say that I know of two cases in which it has occurred this summer, in this city. In one the patient died after Cæsarean section for the removal of the head; and the other died and was buried with the head still in the cavity of the uterus.

DR. J. L. LUDLOW said: When I was a student Dr. Hodge taught us to apply the forceps only after careful deliberation and consultation. Since then the forceps have come into more common use; and there are certain practitioners, who, if labor does not terminate in a certain set time, will always apply them, and who thus get a reputation for quick delivery, and draw

patients. The obstetrician needs a great deal of patience, and great injury is often done by want of it.

DR. PARVIN said: The reason obstetric paraplegia is not seen at six or seven years is that such paraplegia is caused by rupture of the spinal cord connected with fracture of some portion of the vertebral column, and death follows very quickly, usually within a very few hours.

As to the treatment of fractures of the femur in the newborn, I regret that a gentleman present did not narrate a case of such injury to which several practitioners were called. Their first effort was to extend the limb completely, in order to treat the fracture somewhat after the manner of treatment in the adult, but finding their efforts vain, it suddenly flashed upon the minds of the surgeons and obstetricians that an infant did not have its lower limbs extended, and they resorted to a more rational method of keeping the ends of the broken bone in contact, and it was completely successful.

I am not prepared to admit that dislocations of the humerus or femur cannot occur in labor, because reputable observers claim to have seen them, though, of course, they are quite rare.

I cannot help regretting that some time has not been given to the discussion of what is the best method of delivery of the head, especially in pelvic presentation, or after podalic version. Is there not a better way to bring the head through a narrowed pelvic inlet than the great traction upon the body which has been recommended? It seems to be impossible to make that traction directly in the axis of the inlet, and hence much of it is a lost, and therefore useless or injurious, force.

Finally, the relation between protracted labor and forceps delivery, and remote disorders of the nervous system, and especially with idioey, probably has not elicited that consideration its importance demands.

# LAPAROTOMY FOR TUBERCULAR PERITONITIS; PULMONARY CAVITY TREATED BY INCISION; ABSCESS OF THE LIVER.

BY EDWARD T. BRUEN, M.D.,

ASSISTANT PROFESSOR OF PHYSICAL DIAGNOSIS, UNIVERSITY OF PENNSYLVANIA.

[Read November 9, 1887.]

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THE following cases, recently under my care in the Philadelphia Hospital, seem sufficiently interesting to place on record:

CASE I. *Abdominal section for chronic tubercular peritonitis.*—A summary of the prominent features of this case shows the following: John B., aged thirty-four. Admitted to the Philadelphia Hospital May 8, 1887. His first departure from health began June 27, 1880, marked by abdominal pain; swelling of the feet followed in September of the same year. His previous history showed a marked constitutional tendency to abscesses. He had suffered from a great number of these, including an orchitis, which he considered non-venereal. When examined on admission, dry, pleural friction râles were abundantly distributed over the lower zone of each side of the chest, indicating a dry pleurisy, and there were also the physical signs of diffused thickening of the lower portion of the right lung. The sputa contained numerous bacilli of tuberculosis. The abdomen was very prominent and much distended with fluid in the central portion, but in the hypochondriac region of each side the course of the colon was defined as a prominent, resonant swelling. The liquid in the central portions of the abdominal cavity was apparently confined in a species of sac owing to adhesions formed between the peritoneum and the colon, since changing the position of the patient did not change the distribution of the fluid. The liver and spleen were also enlarged, and there was marked dulness in the flanks and lumbar regions posteriorly. The abdominal distention rapidly increased, uninfluenced by any treatment which was instituted. The diagnosis of chronic peritonitis was based partly on the physical signs developed during the examination of the abdomen, viz., its peculiar contour, and the encysted collection of fluid. There was also no heart disease, and though there was a small ring of albumen in the urine, by Heller's test, there was no evidence of serious renal lesion. The associated pulmonary process left little doubt that the nature of the inflammation was tubercular. Moreover, there was no history of injury, nor could any evidence be elicited of chronic inflammatory process in the abdominal viscera which might have had an etiological relation with the peritonitis. These considerations were



especially valuable because the patient's general condition was excellent, color good, and appetite unimpaired. On June 18th a gallon of clear serum, with some few shreds of lymph, was withdrawn. Unfortunately, paracentesis was necessitated about every three weeks thereafter on account of the rapid accumulation of the fluid, and the dyspnoea occasioned by it. The pulmonary process being latent, and the general condition of the patient excellent, laparotomy was suggested, and it was thought that possibly by irrigation of the abdominal cavity by means of antiseptic solutions the character of the inflammatory process could be modified and the reaccumulation of fluid prevented. On June 28th the operation was accordingly performed by Dr. Deaver, assisted by Dr. Montgomery. On opening the peritoneal cavity a large amount of serum escaped, but no pus was found.

The peritoneal surface was much injected and dark red in color, much roughened, and covered with flakes of plastic lymph. After drainage, iodoform was dusted freely over the peritoneal surfaces and the wound closed. The patient's subsequent history was unsatisfactory. Vomiting was a continuous symptom, and death occurred July 6th, nine days after the operation.

At the autopsy it was found that an acute attack of peritonitis had followed the operation. Extensive adhesions existed along the course of the colon; the diaphragm on the right side was welded to the liver, and on the upper surface extensive adhesions to the pulmonary pleura had been formed. The right lower lobe of the lung was infiltrated with nodules of miliary tubercle; the left lung was normal.

This case is reported because the number of cases of chronic peritonitis on record is limited in which abdominal section has been performed. While tubercular peritonitis is a most serious disease, yet the process may become latent, as is so familiar in tubercular pleurisy in the course of phthisis. Just as the gravity of tubercular pleurisy depends upon the pulmonary lesion, so the gravity of tubercular peritonitis depends upon the extent of the frequent antecedent lesions present in the bowels and to the impairment of the functional activity of the digestive tract by the adhesions.

The indications for laparotomy would seem, to the writer, to be the same as those which guide us in the inflammations of neighboring serous membranes, the pleura and the pericardium. Incision should be avoided in tubercular peritonitis unless the inflammation is purulent. Not only so, but when the tubercular process is present even paracentesis should be practised only in those cases in which dyspnoea, from over-distention of the serous sacs with fluid, threatens life. The danger of operative interference in tubercular inflammation of serous sacs is, that the inflammatory process nearly always becomes purulent.

The etiology of the tubercular peritonitis in this case would seem to have been absorption of bacilli from the intestinal canal, possibly from swallowed sputa, particularly as no ulceration of the bowel

could be found. The lesions in the lung were so inconsiderable, when compared with those of the peritoneal cavity, that the possible channel of abdominal infection was unlikely, viz., the inoculation of the pulmonary lymphatics with those of the diaphragm and abdomen. On the other hand, traced from the peritoneal cavity upward, the extensive double pleural process, and the absence of disease of the apex of the right lung, showed that the inflammation probably developed from the peritoneal cavity upward.

CASE II. *Drainage of a pulmonary cavity.*—A man, aged twenty-seven years, was found on admission to the hospital to have all the physical signs of a large cavity in the lower lobe of the left lung. The physical signs were so unequivocal that the cavity was thought to be very superficial, and to occupy a large portion of the lower left pulmonary lobe. The upper lobe was evidently also implicated; the right lung was nearly normal, although at the apex a few moist, crackling râles could be detected.

The history of the case was indefinite, but it was gathered that the disease in the lung came on suddenly about six weeks previously, with pneumonic symptoms. At date, October 20th, the patient suffered very much from cough, expectorated freely pus and nummular sputa, which contained tubercle bacilli. The temperature indicated absorption of septic matter; ranging from 100° to 102°. The location of the vomica prevented the antiseptic inhalations from really reaching the part, and the patient could not readily empty the cavity by coughing. After consultation with two of my colleagues, Drs. Curtin and Osler, it was determined to open the cavity and attempt to secure local drainage. The physical signs of superficial cavity being most intense at the angle of the left scapula, it was decided to operate at this point. Resection of a rib was requisite to obtain working-room, as the ribs are close together at this point. On October 27th the patient was placed under ether, and Dr. Janney, assisted by Dr. Porter, removed about one and a half inches of the ninth rib just within a line drawn from the angle of the scapula. The pleural surfaces were found to be adherent, and the pleural membrane was slightly thickened. It was decided to attempt to enter the cavity with the large needle of an aspirator, and the same was accordingly introduced. Although the physical signs had been so pronounced, yet the needle was introduced two inches into the lungs in several directions without entering the cavity. The punctures caused no coughing, disturbance of respiration, or, in fact, any inconvenience. When the needle was disconnected from the aspirator some little blood escaped, and sufficient air to extinguish a match. Finally, a large-sized trocar was introduced in two directions, and it was thought, from the manner in which the front of the instrument moved, that the cavity had been penetrated. A small drainage tube was introduced, and the wound dressed after the antiseptic method. On the following day the dressings were removed, and it was found that at least an ounce of pus had escaped from the sinus. It was decided to enlarge the sinus in which the drainage tube had been placed, by dilating it daily with rubber catheters. The second day after the operation, while this dilatation was being practised, suddenly several ounces of

pus gushed through the sinus and escaped externally, and thereafter the sucking was heard, so familiar after an empyema has been incised. It was manifest that the cavity had, at least, been freely opened, for now injection of fluids into the vomica could be coughed up through the bronchi. A blunt probe could be passed seven inches directly into the chest, and the impulses of the heart could be detected along the probe.

There were several points of interest in connection with the details of the operation: the first of these was the fact that the cavity was situated at least two inches from the pulmonary pleura. Secondly, the first two days the cavity was either not entered, or only a minute opening was created, and yet no damage to the lung occurred, and the temperature fell a degree and a half.

The propriety of entering similar cavities with the thermo-cautery has been suggested, but when the cavity is situated deeply may not the mode adopted in this case be more simple? Certainly there were no evil effects in the present case. I would suggest, therefore, the puncture of cavities in the lung by trocar, and then a small drainage tube can be introduced through the canula; the drainage tube can be exchanged for a large one by dilating the sinus. The resection of one or more ribs seems to me an important feature in the operation for the opening and drainage of pulmonary cavities, because retraction of the costal wall is facilitated by this measure. The general condition of the patient has steadily improved since the operation, and at date his temperature is normal, with greatly reduced cough and betterment of the general strength. On November 1st he passed under the care of my colleague, Dr. J. C. Wilson.

It is familiar ground to consider the propriety of this operative procedure. I feel sure, however, that the most successful treatment of chronic pulmonary inflammations includes rigid antisepsis as one of its cardinal features. When cavities have formed their local treatment seems very desirable whenever the strength of the patient at all justifies any hope of success from treatment. In regard to the presence of pleural adhesions, these may be counted on whenever the cavity has attained large enough dimensions to allow operative interference to be considered.

CASE III. *Abcess of the liver*.—John R., aged sixty-three years, admitted to hospital October 10th, with temperature 102°, and marked symptoms of the typhoid state. The bowels were involuntarily moved several times in the twenty-four hours. The only other symptom of special importance was severe epigastric pain. The patient had been ill for two or three weeks previously, but could give no account of the symptoms. On October 16th the liver was very noticeably enlarged, at least an inch in all its boundaries. Pain in the epigastrium was a prominent symptom. The left lobe of the liver was enlarged; splenic dullness normal; lungs normal. The passages from the bowels occurred four or five times daily, and were yellow, watery, and offensive.



Temperature: *October* 16, 10 A. M.,  $101^{\circ}$ ; 6 P. M.,  $102^{\circ}$ .

17th, 7 A. M.,  $100\frac{3}{5}^{\circ}$ ; 11 A. M.,  $103\frac{3}{5}^{\circ}$ . 2 P. M.,  $98\frac{1}{5}^{\circ}$ ; 9 P. M.,  $104^{\circ}$ .

18th, 7 A. M.,  $100\frac{3}{5}^{\circ}$ ; 6 P. M.,  $102^{\circ}$ .

19th, 7 A. M.,  $101\frac{3}{5}^{\circ}$ ; 7 P. M.,  $103^{\circ}$ .

20th, 7 A. M.,  $102^{\circ}$ ; 7 P. M.,  $101\frac{4}{5}^{\circ}$ .

21st, 7 A. M.,  $100\frac{1}{5}^{\circ}$ ; 7 P. M.,  $100\frac{1}{5}^{\circ}$ .

22d, 7 A. M.,  $100^{\circ}$ ; 7 P. M.,  $99\frac{3}{5}^{\circ}$ .

23d, 7 A. M.,  $100^{\circ}$ ; 3 P. M.,  $98^{\circ}$ .

On the 17th ten grains of antifebrin were given at 11 o'clock; at 2 P. M., the temp. was  $98^{\circ}$ . Temp. at 9 P. M.,  $104^{\circ}$ . Antifebrin again given, and at 10 o'clock temp.  $101\frac{3}{5}^{\circ}$ . He had a chill at 11 A. M. on the 16th, and at 10 A. M. on the 17th; neither was followed by sweating. The diagnosis of enteric fever was considered and set aside as improbable, on account of the age of the patient, the absence of enlargement of the spleen corresponding to the enlargement of the liver. The disorder of the bowels, the pain in the epigastrium, suggested hepatic disease.

*October* 21. The left lobe of the liver was very positively enlarged and tender on pressure. The right hepatic lobe was slightly enlarged. The right parotid gland was also swollen. The evidence of enlargement of the left hepatic lobe with the foregoing symptoms suggested the diagnosis of suppuration. Aspiration was determined upon, and the needle introduced obliquely through the abdominal wall. The needle seemed to slip up over the dome of the liver. It was then introduced more perpendicularly using some pressure; penetrating the abscess, and several ounces of pus were withdrawn. On the 22d an exploratory incision was made through the abdominal wall over the point of puncture, and the liver incised. Unfortunately, the spot selected for this operation was almost the only square inch of liver which could have been cut without entering the abscess cavity, as will be seen by examining the post-mortem specimen. The abscess cavity lay within half an inch of the point of operation. The liver was stitched to the abdominal wall, and further explorations would have been made, but death occurred on the following day.

Post-mortem examination. The body was that of a medium-sized man very well nourished. On opening the abdomen, the left lobe of the liver was found adherent to the abdominal wall. This lobe of the liver was enlarged, had a grayish fibroid appearance on the surface, and was closely connected by adhesions with the posterior wall of the stomach. On separating the stomach from the liver the abscess was ruptured, and a large quantity of pus escaped. There was also a large abscess cavity in the upper and posterior part of the right lobe. The tissue shows evidence of recent breaking down, and there is much reddish infiltrated liver tissue in the vicinity. There was also a second abscess about the size of an orange in the right lobe near the suspensory ligament.

In the large intestine in the region of the anus, extending two or three inches upward, was a large sloughing mass, with a thick, deeply infiltrated base. The edges of this ulcer were greatly thickened. Extending above this into the sigmoid flexure, were five large ulcers, and a second large sloughing mass. No ulcers were seen on the ascending and transverse colons.

The portal vein was free from clots. The kidneys were sclerotic, and their

eortical portion much diminished. Spleen was soft and of normal size. Heart: the left ventricle was hypertrophied, aortic arch dilated and atheromatous. Lungs oedematous at bases and emphysematous at edges. Right parotid gland was enlarged; shows on incision into substance, numerous foci of suppuration. The hepatic abscesses are, therefore, undoubtedly embolic, and the lesions in the large intestine were the source of the embolism.

It is noteworthy that no hemorrhage occurred when the liver was incised. It also appears to me that the best method of locating a deep abscess after incision of the abdominal wall, would be by passing a trocar into the abscess cavity, and then dilating the sinus. This method would obviate the danger of hemorrhage from the hepatic structure when it may be considered inadvisable to use the thermocautery. The recital of this case affords the writer the opportunity to say that he is satisfied that the liver can be safely explored with a moderate sized aspirator needle. He has frequently practised this method in doubtful cases without ever having noticed unpleasant consequences. Finally, without entering upon a detailed study of the general diagnostic features of hepatic abscess, it will be observed that the temperature chart of this case shows a wide diurnal variation in the temperature, yet the subnormal temperatures frequently noted in hepatic abscess were not present, and as antifebrin was used in the treatment, the subsidence of the temperature was probably due to the use of this drug. The temperature, therefore, was much more that of a continued fever, than is commonly noticed in these cases.

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## DISCUSSION.

DR. W. OSLER said: I think that in these cases of abscess of the liver, we should, if possible, arrive at an accurate opinion with reference to the etiology of the abscess. I saw this case once or twice with Dr. Bruen, and I think that if we had made a careful examination of the rectum, the liver would not have been explored, as abscesses resulting from dysenteric processes in the large intestine are almost invariably multiple. To explore the liver thoroughly in a case of multiple abscess is a hopeless surgical procedure.

With reference to the case of tubercular peritonitis, I may say that these cases frequently come before surgeons and gynecologists for diagnosis. In some cases the effusion simulates closely a tumor. I do not believe that surgical interference will ever come into vogue in the treatment of this condition, as the general condition of the patient is, as a rule, such as not to warrant surgical interference. In the case reported to-night, the rapid accumulation of the fluid brought in an element which rendered it more probable that incision would be of service.

DR. W. H. PARISH said: I have had no experience in exploring the liver

for pus, but I should hesitate a long while before accepting the statement that it is safe to explore an abscess in any organ where it was necessary to pass the needle through the peritoneal cavity. If adhesions exist between the two peritoneal surfaces, the exploration may be safe. The experience of all abdominal surgeons is that aspiration of a tumor within the abdomen, more particularly of tumors containing pus or irritating fluids, is attended with considerable risk. I think that aspiration of an abscess of the liver, where adhesions had not formed, would be attended with more risk than the aspiration of an ovarian tumor, and the risk attending the latter is not small. The usual septic character of the pus, of an abscess in the liver, must render aspiration peculiarly hazardous. The thrusting of an aseptic needle into healthy liver tissue is, however, doubtless quite safe.

DR. J. B. ROBERTS said: I scarcely think that tapping of the liver is such a dangerous procedure as would be indicated by the remarks of the last speaker. If I had a case of suspected abscess of the liver, I should introduce an aspirating needle in various directions with a great deal of certainty that I should do no harm. There would certainly be no harm if an aseptic needle were used and there were no pus. The escape of a little aseptic blood into the abdominal cavity is not a serious matter. It would be a more serious matter to leave an abscess of any ordinary size undetected.

Abdominal section in cases of tubercular peritonitis seems hardly in accordance with our ordinary ideas. In the paper to which Dr. Bruen has referred, I see that the author has claimed that good results were obtained. I can hardly see what good could be expected from it.

DR. W. G. PORTER said: Some six months ago a patient was admitted to the Presbyterian Hospital. There was a considerable collection of fluid in the abdomen, and on palpation a growth could be felt, the exact nature of which we could not determine. It was decided to make an exploratory incision. On opening the abdomen an extensive tubercular peritonitis was found. Since the operation, the woman has remained in about the same condition as previous to it.

DR. BRUEN said: With reference to exploration of the liver, I gave expression to my opinion because I think it desirable to have the experience of those who have punctured the liver. Not long ago I saw a case of suspected abscess of the liver, and on three separate occasions I punctured the liver in different directions before I succeeded in obtaining pus. Although the abscess was a large one, no harm resulted from the punctures. In one case, I punctured the liver as often as six times, but failed to find pus. This patient recovered.

I would reiterate that with aseptic precautions, I consider this a safe thing to do. The calibre of the needle should be as small as possible. At the same time, the pus is often thick, and it is necessary to employ a needle of fair size. Of course, if it was thought that there were a number of abscesses in the liver, we should not think of operating, but in view of the uncertainty which attends the diagnosis, I think it right to give the patient the benefit of the doubt. All of the cases of abscess of the liver that I have seen in this city have been pyæmic. In one case, the abscess sac was very large, and if drainage had been secured early, temporary benefit at least would have been obtained. #



## LAVAGE IN THE TREATMENT OF GASTRIC AFFECTIONS.

BY SOLOMON SOLIS COHEN, A.M., M.D.

[Read November 9, 1887.]

ANY agent, or any method which promises to enlarge our therapeutic resources against those obstinate conditions of "gastric catarrh," "functional dyspepsia," etc., which are a source of distress to the patient, of annoyance to the physician, and of profit to the pepsin and patent-medicine manufacturers, deserves at least a respectful consideration. The method which I desire briefly to present to the Society this evening—lavage, or irrigation of the stomach—has been employed for many years in Europe, so that it can no longer be considered to be merely on trial. In America, however, it has not won general introduction, nor am I aware that any discussion of it has been had before this body. This, then, is my excuse for calling attention to a subject in connection with which I have nothing new to communicate.

It needed not the discovery of omnipresent bacilli, those evil spirits named "legion" of our modern superstition, floating about, "seeking whom they might devour," to enforce the value of cleanliness. The surgeon long ago discovered that clean surfaces would unite more promptly, that a wound kept free from foreign substances and irritating secretions, would undergo a more rapid and more satisfactory course toward repair, than if the conditions were otherwise. In the treatment of the more readily accessible mucous surfaces, whether of the eye, the nose, the throat, the vagina, or the urethra, the importance of keeping the parts free from morbid secretions, from the products of desquamation, and other sources of irritation, is not a matter for debate. The extension of the same principle to the treatment of affections of the gastric mucous membrane, is but a question of mechanical detail, not of therapeutic justification.

Kussmaul in 1867 employed a doubly-acting stomach pump to

irrigate the stomach with alkaline solutions (Carlsbad water), and it is to this observer that we are principally indebted for a study of the method, mechanically and therapeutically. It is said, however, by Dujardin-Beaumetz, that a French physician, Blatin, had proposed the practice in 1832. It is to another French observer, Fauché, of Paris, who communicated his procedure to the Academy of Medicine in 1879, that we chiefly owe the simplification of the technique by the use of siphonage; a process employed independently by Oser, of Vienna, at about the same time. Others have variously modified the details of instrumentation and practice. Among those who have contributed most to the popularization of the method, is Dujardin-Beaumetz, who applied to it the name *lavage*, by which it is now described.

The manner of performing lavage, recommended by the latter observer, is that which I have followed in the few cases in which I could induce private patients to submit to it. The results obtained in these cases have been sufficiently encouraging to induce me to continue at least to propose it, wherever it seems applicable.

The apparatus and its employment are sufficiently simple. An œsophageal tube with blunt, double-eyed extremity, of flexible rubber, about twenty-eight inches long, and from one-quarter of an inch to a little less than half an inch in diameter—practically an enlarged catheter, and made of similar material (the one exhibited having been made by Tiemann & Co., of New York)—is attached by a small section of glass tubing to a soft-rubber tube about one yard in length, into the free extremity of which a glass or rubber funnel, of from six ounces to eight ounces capacity, is inserted. Sometimes the free extremity of the œsophageal tube is slightly stiffened.

The patient sits, or stands, facing the physician. The œsophageal tube having been dipped into warm water or warm milk, is placed within the entrance of the œsophagus, and is then propelled by successive pushes into the stomach; the process being facilitated by efforts at deglutition on the part of the patient.

Many patients quickly learn to introduce and swallow the tube without assistance. A mark on the tube shows when a sufficient length has been introduced (say eighteen or nineteen inches). The funnel is then elevated to the level of the patient's forehead, and from a pint to a quart or more of the lavage solution is slowly poured in; the glass junction tube permitting its passage to be watched, and obstruction or attempted regurgitation to be detected. The patient's sensations will usually inform us when a sufficient quantity of the

solution has entered the stomach. As the last portion of liquid disappears from the funnel, the soft-rubber tube is pinched near the extremity, the funnel is rapidly inverted over a receptacle placed upon the floor; and the contents of the stomach are thus removed by siphonage. These manoeuvres are repeated until the returned fluid is clear.

The first introduction of the tube, and possibly the second and third, will occasion more or less dyspnoea, often nausea and retching, rarely vomiting. These effects, though partly physical, are largely psychical; and will disappear with tolerance. The dyspnoea may be immediately checked by insisting on full inspirations. Nausea is overcome as soon as the water enters the stomach, floating the tube away from immediate contact with the mucous membrane. In highly neurotic subjects, it may be well to prepare for the operation, at first, by administering full doses of bromides. I have tried anointing the end of the tube with a solution of cocaine in glycerine, but cannot claim any striking benefit from the procedure. Firm but skilful handling of the tube is the best sedative.

Sometimes during the withdrawal of the solution, solid particles of food (grains of corn in one of my cases) may become impacted in the eyes of the tube, and the flow of liquid will cease. A little more of the solution must then be introduced, both to wash away the obstruction and to reestablish the siphon current. If the tube should be pushed too far into the cavity of the stomach, it may curve upon itself and the siphon will not work. Withdrawal of the tube for a few inches, will remedy this; if the flow is not readily established, it is said that it may be favored by manipulation of the stomach, and efforts at coughing may be made by the patient. I have not had occasion to resort to these devices.

When *lavation* alone (washing) is the object of the procedure, a weak alkaline solution is employed; a drachm or two of sodium sulphate, sodium chloride, sodium borate, or sodium bicarbonate, in a quart of warm water, at about 100° F.

Should it be considered necessary, however, various sedative or antiseptic medicaments may be added to the lavage solution. Those most highly recommended are resorcin (one per cent.), boric acid (one per cent.), creasote (one per cent.), carbon disulphide water (one part of a solution containing fifteen grains to the quart, to two parts of water), charcoal powder (two to four tablespoonfuls), chloroform water (saturated), bismuth subnitrate (two tablespoonfuls to the pint).

In the use of agents like resorcin, carbolic acid, etc., the liability



to absorption if the solution be not all removed, must not be forgotten. In using what he terms "milk of bismuth," Dujardin-Beaumetz advises that the solution be allowed to remain a few minutes in the stomach, so as to allow the bismuth to be deposited; after which the supernatant liquid may be withdrawn.

Lavage should be performed when the stomach is empty; therefore, some authors recommend the hour of rising in the morning. I have found noon—say four or five hours after a light breakfast—or the same interval after lunch or dinner, to be more convenient for myself, and to answer as well in most instances.

One lavation daily is usually enough. After a while the intervals may gradually be lengthened, until the process is discontinued.

*The therapy* is sufficiently obvious. The effects are said to be most marked in cases of dilatation of the stomach, in which delayed digestion, retention and putrid fermentation of the contents of the stomach, give rise to distressing symptoms. In all cases, where the gastric mucous membrane is in a catarrhal condition, coated with the glairy mucus which is seen amid vomited matters, or bathed in the sour liquid ejected as "water-brash;" where the production of gastric juice is impeded, or the secretion altered in quality by an abnormal condition of the membrane, extending perhaps into the tubules, or by the presence of irritative matters; where fermentation of ingested and retained matters takes place; in short, in the typical case of chronic gastric catarrh or acid dyspepsia, lavage will be found highly useful. It removes any undigested matters remaining in the viscus, cleanses it from products of desquamation and morbid secretion, and gently stimulates the glands and absorbents to healthy action. In gastralgia dependent upon the presence of irritating matters, and sometimes in cases apparently idiopathic, lavage with the employment of chloroform or bismuth as a sedative, is said to be productive of cure. I have had no opportunity to test the statement personally.

In the chronic gastritis of drunkards, the measure is said to be an excellent palliative, nor is hæmatemesis considered a counter-indication, unless actual ulceration exists. In cancer of the stomach it is useful as a palliative measure; and my first practical acquaintance with this method of treatment was made during my student days, in two cases of gastric carcinoma treated after the method of Kussmaul, with doubly-acting stomach-pump, at the hospital of the Jefferson Medical College, in the clinic of Prof. DaCosta.

Within the last few years two new applications of the lavage method have been found. In 1885, at Kussmaul's clinic, and subsequently by

Senator, Rosenthal, and other observers, it has been successfully employed in the treatment of ileus. Kussmaul explains this result by the theory of relief to the tension above the point of constriction, caused by gases and accumulated feces; with concomitant restoration of normal peristaltic action. Since 1884, Leube and other observers have made chemical and microscopical examinations of the gastric secretions and other matters removed from the stomach at various periods of digestion, and claim to have thus obtained valuable diagnostic indications. This subject, however, is beyond the scope of the present communication.

While the practice is usually confined to chronic cases, I have had occasion to resort to it in one case of acute indigestion with obstinate vomiting, in a phthisical, slightly hysterical, female; with gratifying result—in that the vomiting, rebellious to diet and medication, yielded to two applications of the stomach tube. In this case, before withdrawing the tube, warm milk was introduced into the stomach; a measure advocated by French writers. Indeed, there can be little doubt that, in connection with *gavage*, or forced feeding, irrigation of the stomach assists in maintaining nutrition in phthisis and other wasting diseases.

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## DISCUSSION.

DR. J. TYSON said: I have had some experience with lavage, although I have not employed it in the last ten years. In one case of dilatation of the stomach it was used with a great deal of comfort to the patient. He learned to introduce the tube, would wash out his stomach, and enjoy a good meal afterward. He subsequently passed from under my observation, but I heard of his death, which was, I believe, due to the disease which had caused the dilatation—cancer of the pylorus. In a second case in which I employed it, the result was not so satisfactory, and it caused great discomfort.

DR. W. OSLER said: I should like to state my experience in the use of irrigation, as this is a measure in which I have been interested for several years. In the first place, there is serious objection made to the procedure by at least one-half of the patients, on account of the discomfort experienced in the introduction of the tube. The soft tube is sometimes very difficult to pass, and sometimes it is necessary to resort to the stiffer tube. Where the patient himself performs the operation, it is, of course, better that he should have the soft tube.

I am of the opinion that this measure has a much narrower field than the statements of the French and German writers would lead one to infer. I should not hesitate to predict that within a few years, when the fashion has subsided, this measure will be confined entirely to cases of obstinate gastric

catarrh in which it is of inestimable service, and to cases of dilatation of the stomach, in which it is not only of service but absolutely indispensable. We have no satisfactory treatment for dilatation of the stomach other than irrigation.

DR. E. MARTIN said: During my term of service at the University Hospital, this method of treatment was introduced by Dr. William Pepper, but our experience was, as Dr. Osler has stated, the patients would not remain. The measure was tried in six or seven cases, and all but one left. The patient who remained experienced marked benefit; he gained in weight, and when he left the hospital six months later, was able to pass the tube himself. The difficulty which I have recently experienced in one case is, that the patient would vomit the tube. This I overcame by using a stiffer tube.

DR. J. P. C. GRIFFITH said: During the past year I have been much interested in lavage in the diagnosis of diseases of the stomach; the German medical papers have been full of the subject. We in America are, however, unable to study the matter to any great extent, owing to the rebellion of patients to this method of examination. German patients appear to be more tractable, and Riegel reports that during the year 1885 he made over 1300 examinations of the gastric juice in 122 cases; and in 1886, tested 134 cases in a similar way. Every patient presenting evidences of disease of the stomach was submitted to lavage, and the gastric contents thus obtained were subjected to a chemical examination. Riegel's method is to administer to the patient an ordinary mixed meal, and, after about six hours—the stomach should be empty at the end of seven hours—to remove the gastric contents, if possible, undiluted by the employment of water, and to filter them. He then tests the filtrate in order to determine especially the presence or absence of hydrochloric acid, and the peptic strength. The tests are at once simple and very delicate. He employs a variety of these, but the ones which have proved most satisfactory to my hands, and with which I feel most familiar are the reactions with methyl-violet and Congo-red for hydrochloric acid; and Uffelmann's carbolated iron test, for lactic acid. In the presence of a small amount of free hydrochloric acid a dilute solution of methyl-violet will turn to a blue color, and Congo-red will also be changed by the acid to a blue. The results of Riegel's experiments are very interesting, and have been fully confirmed by Korczynski and Jaworski, and by Sansoni. It has been found that in carcinoma of the stomach hydrochloric acid is almost invariably absent, and that the peptic strength of the gastric juice is wanting; so that the attempt to digest albumen artificially with the filtrate fails. In dilatation of the stomach there is always a large amount of lactic and butyric acids, though hydrochloric acid and pepsin are also present. In dilatation, therefore, the trouble is not due to lack of digestive power, but to stenosis or to want of muscular power. Gastric ulcer is almost always preceded and accompanied by a hyper-secretion of hydrochloric acid. In cases of ordinary dyspepsia there is not a diminution of the gastric juice, but usually a hyper-secretion. Riegel claims, therefore, that it is bad therapy to put every case of dyspepsia on a routine treatment of hydrochloric acid and pepsin; and that the chemical examination of the gastric contents is a *sine qua non*. A case recently in the University Hospital illustrates the value of this aid to diagnosis. A man was admitted in an extremely anæmic and emaciated condition, and with subjective and objective symptoms of gastrectasia. The signs



of this disappeared, however, when the diet was carefully regulated; but in spite of the apparent digestion and absorption of food, he became more anæmic and weaker. The diagnosis of carcinoma of the stomach was entertained, and it was thought that some induration could be detected in the pyloric region; but the contents of the stomach were removed with the tube, and the filtrate found to contain an abundant supply of free hydrochloric acid, and to digest albumen perfectly. On this ground carcinoma of the stomach was excluded. The man subsequently died, and cancer was found to be absent; the source of the induration being a thickened and somewhat stenosed pylorus, due to a duodenal ulcer.

There is at the present time another case in the hospital, where gastric ulcer has been suspected, but the examination of the contents of his stomach have shown that digestion is retarded, and that there is no reaction for hydrochloric acid with the methyl-violet test. Assuming that the German observers are correct, the presence of ulcer is excluded in this case.

THE PRESIDENT, DR. J. S. COHEN, said: I can personally speak of the value of lavage in the treatment of dilatation of the stomach and in carcinoma. For the past twelve years, at least, I have been in the habit of using this measure, from time to time, during my terms of service at the German Hospital. Following the example of Kussmaul, we have usually used a solution of the Carlsbad salt of the strength of the natural water. In cases of dyspepsia, we have more recently preferred to use copious draughts of hot water to wash the contents of the stomach into the bowel. In the introduction of the tube into the stomach a great deal depends upon the skill and experience of the manipulator. We had for several years a male nurse at the hospital who could introduce the tube much more readily and with less repugnance on the part of the patient than I could, or could any of the residents. One patient with carcinoma of the stomach used this treatment continuously during a period which covered at least two of my annual terms of service, and his example was a great encouragement to others to submit to the treatment. I would suggest that the tube could probably be swallowed with greater ease, if its lower end were weighted with a ring of lead.

DR. COHEN said: My object in presenting this paper was to elicit discussion, rather than to present something new. My experience, as implied in the paper, has been that of Dr. Osler, that it is difficult to get patients to submit to this measure. If, however, the first three or four times can be bridged over, the relief afforded is so great that the patient will allow it to be continued as long as necessary. Although I have passed the tube on some dozens of cases, the number of patients that I have systematically treated in this way has not been great—only eight in a period of two years. Still, the results obtained in these cases of obstinate gastric catarrh, after the failure of all medication and regulation of diet, have been so satisfactory in the relief of symptoms, and in the almost reëstablishment of the normal condition, that I am encouraged to continue the use of the procedure. In dilatation of the stomach it is especially recommended, and is the only thing to be done.

It would seem that in cases of vomiting due to the presence of sarcinæ, washing out of the stomach, with the subsequent introduction of a sufficient quantity of some safe antiseptic solution, would be one of the best plans of treatment. The tube has also been used in cases of poisoning, where the stomach-pump was not at hand.

FOREIGN BODIES IN THE URETHRA AND BLADDER.  
REMOVAL BY THE LITHOLAPAXY EVACUATOR  
WITH LARGE, STRAIGHT, OPEN-  
ENDED CANULA.

BY DE FOREST WILLARD, M.D.

[Read November 9, 1887.]

MY object in bringing before you the subject of urethral and vesical foreign bodies is simply to emphasize the value of the evacuator (ordinarily used in rapid lithotrity to extract the calculous fragments) for removing other more or less solid substances that have found their way into the urinary tract, either by accident or design.

Foreign bodies enter by various routes. Projectiles may reach the viscus and remain in its cavity; bones may be driven in by crushing forces; foetal remains may ulcerate through from extra-uterine cavities; intestinal contents may occasionally make their way into the bladder, but all these are either rare, or are accompanied by such traumatism that death frequently ensues.

The bodies that we will especially consider are those introduced through the meatus urinarius, urinary calculi being only incidentally considered.

The strong tendency for manipulation of this part of the body that exists from early childhood to decrepit old age, leads to many instances of misadventure. Think of a lad actually sliding a watch-chain down his urethra. Examples of inserted beads, pebbles, sticks, etc., are numerous in childhood. After puberty the tendency becomes more marked as the sexual desire increases. A few years later we find the morbid recluse, especially among the shepherds and monks of former centuries, resorting to intra-urethral stimulation with sticks or other hard substances to arouse the over-exhausted functions, waning from excessive masturbation or venery. Yielding himself to his vile erotic feelings, the instrument often slipped from his fingers and was lost in the canal. Sexually insane must have been the shep-

herd who had used for this purpose his pocket knife, after manual friction and urethral stimulation had proved unsatisfactory, until little by little, through hundreds of these indecent acts he had laid open the entire penis along its dorsal aspect until the pubis was reached, and the penis hung in two halves, united only by the lower wall of the urethra. Then with a short stick he was able to tickle the very orifices of the ejaculatory ducts. This stick slipping into his bladder, became encrusted, and it was not until the pain became torturing, that he confessed the cause. Pipe-stems, pencils, thermometer tubes, glass rods, straws, needles, wires, twigs, hairpins, fruit stones, and even forks and lockets, have all been found in the urethra, after introduction for stimulative purposes, or to relieve dysuria from stricture or other causes. In one instance<sup>1</sup> a man introduced the sewing needle of the girl whom "he desired to fall in love with him."

At the present time we have fewer of these lecherous accidents, save from drunken debauchees, but the majority of instances occur from the use of old or improper catheters or bougies. Of course, these accidents are more frequently found in men than women, as the former are more subject to urethral disease, and are also more erotic, but there are instances in both sexes.

In children, small round bodies, as beads, etc., are found in the anterior part of the canal, while the longer instruments at all ages slip back to the membranous portion of the tube, or into the bladder.

Usually a long foreign body will find its way into the bladder in a few hours; rarely, two or more days may be required. In exceptional, rare cases, rounded bodies remain a long time in the urethra, the urine following a tortuous course around them, and, becoming encrusted, a pocket ultimately forms, or suppuration ensues.

It is not strange that catheters and similar instruments are broken off in the canal when we learn of the recklessness of a man who used one gum catheter for twenty years, or of another who attached two portions of a silver tube simply with sealing wax.

A too short instrument has often eluded the grasp of the surgeon and slipped bladderward.

As to this recedence of instruments, which is strong and actual, there have been many theories. It does not seem strange to me that the compressor muscular fibres of the urethra, when stimulated to action by a body applied in front, should reverse their usual action

<sup>1</sup> Ponlet: Foreign Bodies in Surgery.



as easily as do the muscles of the pharynx, œsophagus, intestines, etc. This act of swallowing a hard substance is aided by the erection of the penis, which in its subsidence (should the anterior end of the object become engaged) drives it further and further back with each successive engorgement. Tending to this same unfortunate end are all the manipulations of the part, in the patient's endeavor to extract the offending body.

Unfortunately for the safe extraction of these bodies, the surgeon has to meet with a large amount of deception upon the part of the patient, when the object has been self-introduced, and it is often impossible to obtain any reliable information either as to the presence of the foreign mass or as to its conformation. In broken bougies the surgeon should, if possible, have the other remaining fragment in his hand for measurement, or else secure one of similar size. Any object of peculiar shape should be accurately described, or duplicated. It must be remembered, that while a patient may confess to the introduction of but one body, there may be several. The position in the canal must be thoroughly fixed. In the ante-scrotal region this is easily accomplished, and with the aid of a sound and a finger introduced into the rectum even the posterior urethra can be well examined, provided inflammation be not too severe. When possible, no manipulations should be attempted for extraction without the body being firmly secured from further recedence.

Ether is of the greatest value, but cocaine injections may answer for urethral work.

TREATMENT.—About one-tenth of inserted foreign bodies will be spontaneously expelled, but when the *vis a tergo* of the urine fails to wash out either a calculus or an object inserted through the meatus, the safest and surest plan is to attach to an ordinary litholapaxy evacuator (Bigelow's or other improved pattern) a large, straight tube, which is open at both ends. It contains a movable stylet for ease of introduction. The size should be the largest that the urethra will possibly admit (after nicking the meatus, if necessary), say French No. 29 or 30; American, No. 19; English, No. 16, for adults; children in proportion. The possibility of the passage of the body through the tube should be determined, if possible, by actual trial, provided a similar piece can be obtained. Rarely will any bougie larger than the above-named size be found in the bladder or urethra.

The method has been so satisfactory in my hands, as is proven by the collection of objects before you, that I always resort to it with confidence, to the exclusion of all other primary devices.

If lodgement has occurred in the urethra, the canal must be firmly closed by finger pressure behind the object, while the metallic tube is slid down and carefully caused to engage the catheter or other mass within its calibre, when the bulb of the instrument is slowly compressed until the water has distended the urethra to its fullest limit, thus liberating the body, when suction is suddenly applied while the penis is stretched forward. Unless the mass be firmly caught and imbedded in a pocket, this manœuvre rarely fails after a few trials. The quantity of water that can be contained in the urethra is so small that the body may require two or three efforts to withdraw it the whole length of the instrument. The water should be injected very slowly, but the suction current must be made forcibly. Inspection of the rubber tube can be made through the upper opening without detachment of the catheter.

Avoid employing forceps until unsuccessful with the above method, but when necessary to be used, the superiority of the canula again asserts itself. The forceps can be manipulated through its calibre, and if the object be compressible enough to pass the bore, withdrawal can be accomplished without the slightest injury to the mucous membrane. Objects of larger size than this tube can seldom be withdrawn with safety by any method save cutting. Hairpins can be compressed through the walls of the urethra, and their points passed into the calibre, when they can be completely pushed within the bore and easily withdrawn.

Beads, peas, pebbles, etc., will easily enter the canula by suction. Catheters, wires, etc., will usually require the assistance of forceps. Barbed heads of grain can also be ensheathed and withdrawn by this device.

If the object has passed into the bladder, the evacuator becomes an even more essential aid. A straight instrument is not always easy of introduction, but the security gained against subsequent urethral injury abundantly repays for the trouble. If a flexible or spirally cut obturator is used, the introduction is rendered much easier. The tube is used first as a sound to discover the offending body, when the bulb of the evacuator is first slowly compressed, so as not to disturb the fragment. Suction should always be made quickly, so as to draw the body with force. Failing, the water is next ejected with more energy, so as to move the fragment into better line with the calibre, suction being again rapidly applied. The hard substances will not be driven against the sides of the bladder with any more power than are calculous fragments, and unless consisting of broken glass will not be

as angular. If the body is rounded, and of size that can pass the bore, it will in a few moments be found in the bulb. If very long, like a catheter, or pencil, or wire, the chances are not so good that it can be brought into line with the calibre of the tube. As a bougie ordinarily breaks at or near the eye, however, its passage is more than probable. Failing, after ten minutes of gentle trial, a lithotrite should be introduced if the body is a bougie or pencil, and is capable of being cut or pinched in two, and the division made. A cutting lithotrite, like Caudemont's, is manufactured, but I presume is seldom found among the paraphernalia of surgeons, and the fenestrated instrument of Thompson is far safer. If the bougie is old and brittle, as is presumptively the case, such division with a lithotrite is easily accomplished. The segments can then be sucked out, and their total length carefully compared with the remaining portion or lost body. Every particle must be secured, lest it form the nucleus of a future calculus. Even the broken jaw of a lithotrite might be drawn into the bore.

If the surgeon has not the straight tube with open end, which I advise, he may use the ordinary straight evacuating tube. Rounded bodies, and pieces of bougie small enough and flexible enough to enter the side opening can often be secured with ease, but long or rigid pieces can only be drawn through the open-ended tube. This tube has the disadvantage that the point must be kept just inside the neck of the bladder. If pushed too far, the posterior bladder wall flaps against it; if withdrawn too much, it is concealed in the prostatic portion, and makes no suction upon the vesical contents. Its safety from impaction of fragments in the eye, however, more than counterbalances this slight trouble; since, in the ordinary evacuating tube, a large fragment often cannot be dislodged from the eye, and lacerates the urethra during withdrawal.

Should these manipulations fail (and if they have been carefully conducted, no injury need have been done to the bladder), I show you now two forms of forceps which I have had made of just sufficient length to be slightly protruded from the end of the tube. In the one, the jaws open by a spring, as in the old Halles' forceps; and in the other, the jaws are worked by handles, as in the Mathieu and Gross, and "alligator" patterns.

Careful attempts can now be made to seize the body and extract it through the catheter. If small enough to be brought through, it is a great satisfaction to know that no possible injury can be done to either the neck of the bladder or the urethra, as is so likely to occur when a body is extracted in the jaws of a lithotrite. Necessarily only a small



proportion of introduced objects can be removed per urethram, and I should lay it down as a rule that any foreign body too large to pass the calibre of this No. 29 tube, unless it be very soft and pliable, should be removed by lithotomy, either perineal or suprapubic. Lithotomy has its dangers, but laceration is worse.

The suprapubic is at present the fashionable operation, and it certainly presents many inducements in its favor. The median perineal operation, however, is a safe one, and gives excellent results. No important structures are severed, and there is seldom troublesome hemorrhage if the raphè is closely followed. By either of the routes great care must be exercised in the search, if the object be sharp-pointed, lest a perforation be made. The inflation of the rectum in order to lift the bladder, must be dispensed with if the object is sharp-pointed. The upper route gives more room, and while there is a slight risk of wounding the peritoneum, yet we must remember also, in the extraction of large objects, as well as calculi, by the perineal route, that the rectovesical fold of the peritoneum is in close proximity to the neck of the bladder, and may not escape involvement in the subsequent inflammatory action.

If the walls of the bladder were only of sufficient strength to warrant their immediate sewing with catgut or silk, and permit primary union under strictly antiseptic dressings, while the urine were drained off below, the suprapubic route would certainly be decidedly the better one; but as this is not the case, there is still room for honest differences of opinion in the selection of an operation. For the present, we must be content to drain the suprapubic wound.

*In the absence of an evacuator*, the expulsive force of the urine is often sufficient to dislodge a urethral impaction, especially if the meatus is closed for a moment, so as to obtain the full dilating power of the water. Failing in this effort, if the foreign body can be located and the urethra closed, a large injection of sweet oil may be thrown in, after a hot bath, and the largest possible bougie carried down to the body to stretch the membrane, while pressure from behind is made either by the surgeon's finger or by the expulsive efforts of the patient's bladder.

Should lodgement be made in the fossa navicularis, the spoon of the ordinary pocket-case can often be hooked behind the object and assist in coaxing it forward. A hairpin, or wire doubled upon itself and slightly bent, or a blunt curette, makes also a valuable extractor. An excellent instrument also is the articulated scoop of Leroy d'Étiolles, which, being introduced past the foreign body, has a mechanism by

which its tip is then bent at right angles to the shaft, and is capable of making strong but dangerous traction. The abruptly short-beaked sound which I always use for sounding the bas fond of the bladder, can sometimes also be "wormed" past the obstruction, and effect its dislodgement. I show you here seven prostatic stones that I have thus extracted, aided by the force of the urine. Long urethral forceps are of great service, as they serve partially to protect the canal during extraction, but they do so far less effectually than does the straight tube before described, which should be placed in every evacuating set. Hunter's or Civiale's three-bladed forceps are occasionally used, but I always look with abhorrence upon dragging any object forcibly through the canal. A dangerous instrument is the urethral lithotrite of Reliquet, as *incision* is infinitely safer for all rough and large bodies.

When the substance lies posterior to the triangular ligament, gentle attempts should be made to push it into the bladder, only after the evacuator has failed to dislodge it. If necessary to operate, the raphè should be closely followed, while a large staff is held in position to indicate the location of the obstruction and of the tube.

An incision in front of the scrotum is easily made, and should be closed after the removal of the body by catgut or quilled sutures. Treated antiseptically, and with either a retained catheter, or with frequent catheterizations, immediate union may be confidently expected. The quilled suture gives more perfect rest by its splint action.

If a stricture exists, and the foreign body is lodged behind it, dilatation or free external incision of the stricture should be practised.

In former days, the instruments for search and removal of these objects, greatly exceeded those of the present day, when operative procedures are more common. The "duplicators" of Mercier, and of Charrière, were intended to fold up any soft substance, as a very flexible bougie. Long stiff bodies were seized by "redressors" or "baseurs," forceps with bevelled blades, constructed so as to rotate the body so that its long axis would correspond with that of the instrument. Occasionally a small lithotrite will answer for either of these purposes, but the great danger of laceration during withdrawal through an unprotected canal, must never be lost sight of.

The curved forceps of Cusco or Voillemier are, perhaps, as useful in the bladder as in the membranous urethra; but I am afraid to use them for the reasons already named, especially since I have found suction so much safer and also more effectual.

For the removal of pins, bonnet pins, or needles, from the urethra, the point can sometimes be imbedded in a wax or gum bougie, but it is

easier washed out with the evacuator. If immovable, the point can be pushed through the walls of the urethra, and by sharply bending the penis, the head after reversal drawn through the tube by suction or by forceps. It is seldom necessary to cut the pin when this method is used.

If a piece of nitrate of silver is lost from a porte-caustique, the evacuator, charged with salt water, should be at once used if the force of urination does not expel the mass.

Many ingenious devices have been practised in the absence of instruments, to rid the urethra of impacted bodies, but the knife is far safer than rough instrumentation. In the absence of the straight evacuating tube, an extra sized catheter, with open end, and a large syringe, might prove useful.

Blood-clots in the bladder are practically foreign bodies, and are best removed by gentle suction through the curved evacuator, or through the blood catheter, which I here show, the large eye of which is closed down during introduction by a spirally cut obturator.

Catheter accidents are so frequent that instruments should be often examined. Only recently I found that the distal extremity of my much-used pocket case instrument could be slipped from its screw-thread by a very small amount of traction. Old gum bougies should be thrown away as soon as they begin to lose their elasticity.

To summarize:

1. The litholapaxy evacuating tube, large, straight, and with open end, is the surest and safest instrument for the removal of foreign bodies from either urethra or bladder.

2. The fenestrated lithotrite should be employed to break up all bodies capable of division.

3. Incision of urethra or bladder is safer than a tear of the neck of the viscus or of the canal.

4. The suprapubic and median perineal are the safest routes of entrance to the bladder when suction fails.

5. Forceps should be used with the greatest care, and always through a straight tube, which insures protection both to the urethra and neck of the bladder during both exploration and extraction.



# A SUCCESSFUL CASE OF AMPUTATION OF THE CERVIX UTERI, IN THE FOURTH MONTH OF PREGNANCY, FOR EPITHELIOMA.

By WILLIAM E. ASHTON, M.D.,

IN CHARGE OF THE MATERNITY WARD OF THE JEFFERSON MEDICAL COLLEGE HOSPITAL, AND  
CLINICAL ASSISTANT ON THE STAFF OF DISEASES OF WOMEN.

[Read November 9, 1887.]

Mrs. H. W., aged twenty-four years, a seamstress, consulted me on the 28th of February, 1887, with the following history: She had been married five years, and was the mother of one child four years old. She had had two miscarriages; the first two and a half years ago, being at the time three months pregnant; the second, two years ago, in the second month of pregnancy. Her labor was normal. Since her last miscarriage she had suffered from leucorrhœa, profuse in amount and yellowish in color, which had been, since the first of January, mixed with blood.

She had also been irregular as to the time of menstruation, the flow appearing every two weeks. During the past year she has complained of pain in the sacral and both inguinal regions, and also a sense of bearing-down weight in the pelvis. Her menstruation had been absent for the past two months. She was anæmic in appearance, her appetite poor, bowels constipated, and she was easily fatigued on slight exertion. There was no family history of phthisis, cancer, or syphilis.

On examination the uterus was found to be enlarged, anteflexed, and movable. The cervix was eroded, and, being friable, bled readily upon the slightest touch. There was also a bilateral laceration extending almost to the vaginal junction. The sound was not introduced.

I did not see the ease again until the latter part of May, when I found all of the subjective symptoms increased in severity, and upon examination the eroded condition of the cervix was found to occupy a much larger extent of surface. The uterus was one inch and a half above the pubes, and upon auscultation the foetal heart sounds were heard, and the diagnosis of pregnancy made.

In consultation with Dr. John C. Da Costa, I snipped off a piece of the diseased tissue of the cervix, and sent it to Dr. M. P. Rively, demonstrator of pathology in the Jefferson Medical College, for microscopical examination. Dr. Rively kindly examined the growth, and pronounced it to be an epithelioma. After receiving his report, I determined to operate, as the disease was

then limited to only a portion of the cervix, and as the growth of an epithelioma is more rapid in the pregnant than in the non-pregnant state, I deemed delay dangerous; and, furthermore, I believed that an operation performed under strict antiseptic measures would not interrupt the pregnancy.

On the 31st of May I amputated the cervix, the patient being at the time nearly four months pregnant, Drs. Horwitz, Rupert, Allison, and Fisher, and Mr. Thomas G. Ashton, being present, and assisting me in the operation.

The preparatory treatment consisted in having the vagina and external genital organs thoroughly antiseptized, for two days previous to the operation, with a solution of corrosive sublimate 1 part to 2000. On the morning of the operation the bladder and bowels were evacuated; the vagina thoroughly washed out with the solution of corrosive sublimate, and antiseptic gauze placed over the vulva. The instruments and needles were thoroughly sterilized with boiling water, and placed in a three per cent. solution of carbolic acid. The sponges and sutures were also rendered aseptic.

*Operation.*—The patient was placed on her back, and drawn to the edge of the end of the table, and her limbs supported by an assistant on either side.

The anterior lip of the cervix was seized with a vulsellæ forceps, and with a pair of scissors the bilateral laceration was extended down to the vaginal junction. The anterior and posterior lips were then amputated even with the vagina; I then with the actual cautery seared the cervical canal. This left a clean raw surface which was covered by stitching together the surrounding vaginal mucous membrane with silver wire, and twisting the ends, leaving the edges open directly over the os uteri, and afterward securing them by sutures to the rim of the os. I then introduced a continuous catgut suture which surrounded the os uteri at a distance of half an inch; this suture bringing the mucous membrane in close apposition with the cervical tissue. The uterus was then restored to its normal position, the vagina washed out with a solution of corrosive sublimate, a suppository of iodoform, containing thirty grains, inserted, and one grain of the aqueous extract of opium was introduced into the rectum.

The after-treatment consisted in a liquid diet for the first three days, the bowels being moved by an enema on the fourth. The vagina and external genital organs were antiseptized night and morning, until the second day after the removal of the stitches, in addition to which corrosive sublimate gauze was placed over the vulva. A suppository of thirty grains of iodoform was inserted into the vagina, night and morning, for four days. One grain of opium was used, per rectum, every three hours, night and day, for the first three days, when the amount was reduced to two suppositories in the twenty-four hours, and this was continued for eight days. The stitches were removed on the eighth day, and union found to be complete. On the fourteenth day the patient was attending to her household duties.

*Remarks.*—The operation was a modification of the one devised by Sims in 1859, which consisted simply in covering the stump of the cervix by bringing together, with sutures, the surrounding vaginal mucous membrane. The objections to this operation, as stated by Goodell, are, “cicatricial closure of the os, and in the danger of

secondary hemorrhage, the mucous lid not making compression enough to close the open-mouthed vessels." To meet the first of these objections I followed the plan of Goodell, and stitched the edges of mucous membrane which were directly over the os uteri to the rim of the os. The danger of secondary hemorrhage I met by the continuous circular suture of catgut surrounding the os, and which I believe to be original with me. This suture not only lessens the danger of hemorrhage, but also assists materially in securing union by first intention.

In performing the operation, as well as in the preparatory and after-treatment, I used thorough antiseptic measures, because upon them I believed, to a great extent, depended the success of the operation, and the continuance of pregnancy. The patient's temperature did not once go above normal during her convalescence.

The amount of opium which was used may seem unnecessarily large, especially as the patient suffered no pain during convalescence. It was however, administered to abolish reflex irritability, and to accomplish this object it is necessary to use large doses.

In conclusion, I will state that the patient has had no return of the disease, and that she is now in the maternity ward of the Jefferson Medical College Hospital.

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## DISCUSSION.

DR. J. C. DA COSTA said: I saw this patient in consultation, and urged an immediate amputation of cervix. It was a case of undoubted epithelioma, and in performing the operation the risk of abortion had to be taken; but this was less than the risk of allowing a cancer to go on untreated in a pregnant woman. In this case I look forward with some interest to the confinement, for, as has been stated, the mucous membrane of the vagina was stitched across the cervix. The question is: when the cervix begins to dilate, will the vaginal mucous membrane stretch sufficiently?

DR. W. H. PARISH said: I think that Dr. Ashton adopted the proper plan of treating the carcinoma of the uterus during pregnancy, where the disease is so limited that it can be removed by operation. Where the disease is so extensive that high amputation of the cervix is demanded, the question arises whether it is better to perform this operation, which will almost certainly cause the death of the fetus, or to wait until full term, and deliver the child through the cervical canal or by the Cæsarean section.

If there is strong reason to believe that after operative interference there will be no recurrence of the disease, the operation should be performed, whatever the result to the fetus. If, however, the disease cannot be thor-



oughly removed, the mother can live but a few months, and the life of the child becomes of paramount importance. The question of removal of the entire uterus when carcinomatous, and pregnant in the early months, should be decided upon the same considerations as determine the removal of the carcinomatous and non-pregnant uterus.

I do not think that Dr. Ashton's patient will have any difficulty during delivery because of the method of operating. The difficulty, so far as the cervix is concerned, will be determined by the presence or absence of carcinomatous infiltration. Cicatrices melt away so promptly in labor, and the vaginal tissues are so extremely distensible, that I think they will occasion, in this instance, no dystocia. Carcinoma of the uterus is an exceedingly dangerous complication of labor, nearly one-half such cases dying either during or within a few days after labor.

## THE NATURE OF LABOR.

BY HENRY LEAMAN, M.D.

[Read November 23, 1887.]

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THIS paper does not claim to offer a solution for all the theories and problems of labor, but is simply an attempt to throw some light on the phenomena of labor, with special reference to everyday work. In speaking of labor, we understand physiological or natural, not pathological labor.

Harvey said that the kind of birth in which the foetus is born enveloped in its coverings, appeared to him by far the most natural; it is like the ripe fruit which drops from the tree without scattering its seed before the appointed time. This statement is doubtless physiologically correct. But in experience the separation of the elements of the ovum generally occurs, the waters preceding and the placenta succeeding the foetus, the true process of labor being in no manner altered or changed thereby. Any presentation or position that can be terminated without assistance may be called natural.

There are only two stages in labor. The first embraces all the phenomena that immediately precede or occur during the dilatation of the cervix. The second embraces all the phenomena that occur during the expulsion of the contents of the uterus. This includes the so-called third stage. If labor has pursued a natural course and due time has been allowed, the placenta will be found loosened by the pains and ready to be removed immediately after the birth of the child. If the placenta is adherent or there is an irregular contraction, the hand can be passed into the cavity to remove it.

The duration of the first stage is a very indefinite period, lasting from a few hours to several days or even weeks. The duration of the second stage is a more definite period varying from a half hour to four hours.

The only positive sign that the expulsion of the uterine contents is about to take place is the dilatation of the distended cervix accom-

panied by regular contracting pains not relieved by opium. Dilatation is not complete until the cervix has expanded enough to allow the exit of the presenting part. Then begins the second stage of labor, and the advancing mass now comes in contact with the pelvic wall.

The nature of labor consists particularly in the manner in which the uterus expels its contents, not in the mechanism of the pelvis. The foetal contents are passive in delivery. The life of the ovum in viviparous animals is part of the mother's life, connected through the uterus and placenta, and identified by a mutual growth and development. The uterus is the outer contractile layer of the ovum. When their cyclical development is complete or has been terminated in any way, differentiation or birth takes place. This is accomplished through contractility of the uterus, which gives to the foetus a series of amœboid movements that cause it to advance through the pelvic opening.

The foetal mass moves under the persuasive action of flexion and rotation produced by the uterus alone; and in virtue of its adaptation to its surroundings, overcomes great obstacles. The overcoming of obstacles is due not to the amount of force, but to the adaptation of the foetus to the pelvis.

Dr. D. B. Hart, in the *Obstetrical Transactions*, Edinburgh, vol. v., in a paper on "The Bearings of the Shape of the Foetal Head on the Mechanism of Labor," says:

"It will be seen that the shape of the foetal head, face, and breech is, to a certain extent, a preparation for the emergencies of birth. In a normal head case in a normal pelvis, flexion and rotation are favored by it. Should the pelvis be rickety, the head, either first or last, still has the shape which favors its passage through the contracted conjugate; and even for minor deviations of face cases and badly rotated occipito-posterior cases, we have the shape of the face and head markedly fitted for the best means of delivery."

The explanation of flexion by Lahs is an advance over the previous theory of articulation of the spine to the occipital bone. Deeper than these phenomena of the mechanism of labor is the force which the uterus exerts, and the manner in which it is applied. The abdominal muscles take no part directly in the expulsion of the uterine contents. Their action is to sustain and conserve the uterine contractions. They cannot be applied in an effective manner in expulsion.

Dr. Hart concludes the paper above referred to with these words:

"Future observations are still needed as to the shape of the head after labor, as bearing on any peculiarity of mechanism, and I hope that this communication will direct the attention of obstetricians to an interesting field."



These mouldings which the head undergoes teach us not only the peculiarity of the mechanism, but also enable us to understand the manner in which the force is applied, and also something of the nature of its action. The common succedaneum found over the parieto-occipital region, which disappears in twenty-four or forty-eight hours, is similar in its formation to the extreme elongation of the occiput in great flexion of posterior rotation or the elongation of the frontal region in frontal presentation, and shows the manner in which the fœtus makes its way by elongation under moderate and gradually applied force.

This closer study of the mechanism of labor, the study of the placenta, and the changes which the uterus undergoes during gestation and immediately preceding birth, belong more particularly to the gynecological concept of labor. The progress by which our present standpoint has been reached has been gradual. The first concept was midwifery, which concerned itself with the most external phenomena of labor, such as holding the hands, making pressure on the stomach, administering drinks, comforting the mind of the patient, placing her in a certain position, endeavoring to dilate the vagina; and when nature could not complete the delivery, the surgeon was called to destroy the child and save the mother.

The second concept was the obstetrical, and had its origin with the introduction of the forceps, in the early part of the eighteenth century. This has led to the closer study of the mechanism of labor, occupying its time mostly, however, in the study of the fœtal head and pelvis.

The third concept dates from the introduction of ovariotomy in the early part of this century.

# ELEVEN CONSECUTIVE CASES OF ABDOMINAL SECTION FOR DISEASE OF THE UTERINE APPENDAGES.

By CHARLES B. PENROSE, M.D.

[Read November 23, 1887.]

ABDOMINAL section is at present such a common operation, and the diseases for which it is performed are so well recognized, that I shall not report these cases in detail; I shall simply tabulate them, consider them collectively, and call attention to any special point of interest which may have occurred in the history of any case.

| Case. | Age. | Married or single. | Disease.                                            | Date of operation. (1887.) | Parts removed.              | Complete closure of wound, or drainage. | Result.   |
|-------|------|--------------------|-----------------------------------------------------|----------------------------|-----------------------------|-----------------------------------------|-----------|
| I.    | 30   | Married            | Salpingitis and cirrhotic ovaries.                  | Feb. 16,                   | Both tubes and ovaries.     | No drainage                             | Recovery. |
| II.   | 24   | "                  | Pyosalpinx and cystic ovaries.                      | Mar. 14,                   | Right tube and ovary.       | " "                                     | "         |
| III.  | 32   | "                  | Salpingitis, multilocular cyst of ovary,            | April 8,                   | Left tube and ovary.        | " "                                     | "         |
| IV.   | 26   | "                  | Double pyosalpinx and ovarian abscess.              | May 19,                    | Both tubes and ovaries.     | Drainage                                | "         |
| V.    | 37   | "                  | Double pyosalpinx, ovarian abscess, and hematocele. | May 25,                    | Both tubes and ovaries.     | "                                       | "         |
| VI.   | 30   | "                  | Salpingitis and blood cyst of ovary.                | June 20,                   | Left tube and ovary.        | No drainage                             | "         |
| VII.  | 23   | "                  | Salpingitis and abscess of ovary.                   | July 3,                    | Left tube and ovary.        | " "                                     | "         |
| VIII. | 33   | "                  | Salpingitis, blood cyst of ovary, uterine fibroid.  | July 13,                   | Both tubes and ovaries.     | Drainage                                | "         |
| IX.   | 22   | "                  | Double pyosalpinx.                                  | Aug. 9,                    | Both tubes and ovaries.     | "                                       | "         |
| X.    | 43   | "                  | Dermoid cyst of ovary.                              | Aug. 17,                   | Left tube and ovary.        | "                                       | "         |
| XI.   | 22   | "                  | Double pyosalpinx.                                  | Oct. 23,                   | Both tubes and right ovary. | "                                       | "         |

These cases were operated upon during the year 1887. They all recovered, and are at present well and able to attend to their various duties.

In five of the cases in this table the appendages were removed on only one side. In one of these cases (Case II., pyosalpinx and cystic

ovaries) I found it impossible to remove the left tube and ovary. They were firmly adherent in a knot on the side of the uterus, and the uterus was bound down in the hollow of the sacrum. In the other cases of unilateral removal I intentionally left the appendages upon one side. With the exception of the case of dermoid cyst, the women were young and desirous of having children; and at the time of operation I could discover no sign of any pathological condition in either the tube or ovary. I am aware of the fact that in cases of tubal disease it is often unwise to perform a unilateral operation and to leave even an apparently healthy tube, as it, in many cases, becomes subsequently diseased from an infecting focus in the uterus.

Though sufficient length of time has not yet elapsed to come to any definite conclusion with regard to my cases, yet so far I have had no cause to regret having left the sound tubes; and in one case the patient has become pregnant since the operation.

A point of interest in connection with the first case (salpingitis and cirrhotic ovaries) is the length of time during which the patient was fed by the rectum. She began to vomit as she recovered from the influence of the ether; and she continued to vomit everything which was administered by the mouth for thirty-six days after the operation. There was no apparent cause for this excessive vomiting. The operation was simple, and was not followed by any obvious symptoms of peritonitis. The rectal injections, by means of which she was nourished for over a month, consisted of pancreatized milk, eggs, and whiskey. Two-thirds of a quart of milk, one egg, and three ounces of whiskey were administered in four or five doses during the twenty-four hours. During this prolonged course of rectal feeding she lost many pounds in weight. No food at all was taken by the mouth; the very small quantities which were occasionally administered experimentally were always immediately rejected. When she finally became able to take food by the mouth it was necessary to give it in the form of twenty-drop doses of soup or beef-tea.

In the table I have made no distinction among the different forms of non-purulent inflammations of the Fallopian tubes. All thickened, enlarged, adherent tubes which did not contain pus, I have put down as salpingitis.

In investigating the histories of the cases of pyosalpinx, it was difficult to determine with any certainty the origin of the trouble.

I could not in any case obtain a clear history of gonorrhœa, though in several I had reason to suspect it. In four of the five cases of pyosalpinx the patients attributed the origin of their disease to a mis-



carriage. In Case V. (double pyosalpinx, ovarian abscess, and hæmatocele) the active suffering dated from a violent fall upon the ice several years before the operation. The fall was followed by bleeding from the vagina, which lasted several days; and from that time until the time of operation she suffered with great pain in the lower part of the abdomen, which rendered it difficult for her to walk erect, and with evening chills after any exertion during the day. It is probable that in this case the fall caused the partial rupture of a previously distended tube.

In all the cases of pyosalpinx there was a history of repeated attacks of pelvic pain and inflammation, which often confined the patient to bed for several weeks.

In two of the cases of pyosalpinx there was also ovarian abscess. In these cases the abscess cavity in the tube communicated directly with the abscess cavity in the ovary, and the origin of the ovarian abscess was obvious. In Case VII. (salpingitis and abscess of ovary), however, there was no pus in the tube. The tube was enlarged, adherent, and its fimbriated extremity was closed; and it did not communicate with the cavity of the ovarian abscess. The ovarian abscess contained about half an ounce of pus and had a distinct pyogenic membrane.

I think that abscess of the ovary is of more frequent occurrence than works upon gynecology admit. And though it probably is in general due to ovaritis caused by inflammation of the tube, yet it is not always associated with pyosalpinx.

In two cases of double pyosalpinx (Cases V. and IX.) a thin purulent fluid was found in the peritoneal cavity, and the intestines were found to be deeply congested when the abdomen was opened. The patients had probably been suffering for some time with general chronic peritonitis excited by the escape of pus from the distended tubes. The symptoms, however, before operation had not pointed to general peritonitis, the patients having only complained of pelvic pain and pain in the back. The chance that such a condition may occur in connection with pyosalpinx is a strong argument in favor of removing these abscesses by abdominal section, instead of evacuating them by the vagina, as is so often done.

The danger of assuming any case of peritonitis in a woman to be idiopathic, without a thorough vaginal examination is obvious. I have the report of a case which occurred recently, where the patient was treated for several weeks for idiopathic peritonitis, and an operation

done a few hours before death revealed double pyosalpinx and a ruptured ovarian abscess.

In six of the cases reported, an abdominal drainage tube was used. The average time of convalescence in these cases was no longer than in the cases where a tube was not introduced; and the severity of the symptoms following the operation—elevation of temperature, rapidity of pulse, and pain—were much less marked in the drainage tube cases than in the others. The absence of pain in the drainage tube cases is probably in part due to the fact that most of them were cases of pyosalpinx where the tissues which were ligated and cut were so far degenerated that their sensibility was much diminished.

I think that the danger of abdominal hernia following the use of a drainage tube is exaggerated. In one of my cases there is now a small hernia, but it occurred above the position of the tube and was probably due to some error in introducing the sutures. In some thirty drainage tube cases which I have seen in the practice of Dr. Joseph Price, there has, as yet, been no hernia. It is probable that hernia is due more frequently to a long or a high incision, and careless suturing, than to a drainage tube.

The average length of time before the glass drainage tube was removed in my cases was about five days; the shortest time was two days, and the longest eight days. In but one case did the discharge from the tube become purulent.

The use of a cotton rope to act as a capillary drain adds greatly to the value of the glass drainage tube. It prevents fluid from remaining in the bottom of the tube, and it removes the deposits of fibrin from the perforations in the glass.

There are so many points of interest in connection with Case X. (dermoid cyst of the ovary), that I shall report it in detail.

The patient was forty-three years old. She had had three children and five miscarriages. She had first observed the tumor eighteen months before the operation. It rapidly increased in size, and when removed it was about six inches in diameter. It had never been accompanied by pain. The rapid growth of this cyst and the late period of life at which it was first observed are, I believe, very unusual.

The patient also had a much distended gall-bladder, and at the operation a calculus was felt obstructing the cystic duct.

During the operation the dermoid cyst was ruptured, and the contents, consisting of very oily material and many fine hairs, escaped into the abdominal cavity and were removed with great difficulty. It was only after thorough sponging and irrigation that the peritoneum was cleansed. A drainage tube was introduced.

The patient suffered from severe shock after the operation. For the first three days the temperature remained normal or slightly subnormal. The pulse was about 115. There was considerable abdominal distention and pain; there was not much discharge from the drainage tube.

On the third day large quantities of bloody serum began to flow from the drainage tube. At the same time the tympany and general abdominal pain became much increased. The temperature ranged between 97.5°-100.5°. The pulse was 130 to 140. The respirations were 40 or over. The tongue was coated, and there was constant hiccough and occasional vomiting. The bowels had not been moved, and there was no escape of flatus.

An ounce of sulphate of magnesia was administered daily, for several days, and many turpentine enemata were given. The enemata were retained for a few minutes, and when they were rejected a large quantity of flatus escaped. The bowels were not moved, and there was no escape of flatus at any other time. As the abdominal distention and pressure increased, large external hemorrhoids, which looked almost like a prolapse of the rectum, appeared.

On the fifth night a rectal tube was introduced, but it rendered but little service. Most relief was obtained from the turpentine enemata, and the patient frequently asked for them herself.

The hiccough and vomiting ceased on the sixth day. The discharge from the drainage tube continued to be very profuse, though of lighter color. The abdominal distention, the pain, and the hemorrhoids were unchanged.

On the seventh day after the operation the suture at the upper angle of the abdominal wound was removed, and the nozzle of a long syringe was introduced among the intestines in order to determine whether there was any collection of fluid in the abdomen which was not carried off by the drainage tube. No fluid was found, and the wound was reclosed.

On the eighth day the bowels began to act. There was profuse watery diarrhoea for twenty-four hours, accompanied by the escape of large quantities of flatus. At the same time all the symptoms of peritonitis began to abate; the abdominal distention rapidly decreased; the discharge from the glass drainage tube became so slight that it was removed. The hemorrhoids began to diminish in size, and by the tenth day they had disappeared. The diarrhoea ceased in two days, without treatment; and three weeks after the operation the patient was able to leave her bed.

I have reported this case at length on account of the interesting phenomena attending the development and the subsidence of the peritonitis; and because it was treated throughout by sulphate of magnesia and rectal injections, and not by opium. And, in conclusion, I may say that it was not found necessary to use opium in any of the cases reported in this paper.



## DISCUSSION.

DR. J. PRICE said : Dr. Penrose's report of his work affords an excellent opportunity to discuss pelvic surgery. While I have been greatly interested in every case reported and know the work to have been perfect from personal observation, I do not wish to discuss this report. I simply wish to speak of the present position of pelvic surgery, by whom, when, and where it should be done.

First. By whom? I will read a quotation from McDowell :

"I think my description of the mode of operating, and of the anatomy of the parts concerned, clear enough to enable any good anatomist, possessing the judgment requisite for a surgeon, to operate with safety. I hope no operator of any other description may ever attempt it. It is my most ardent wish that this operation may remain to the mechanical surgeon forever incomprehensible."

Dr. Penrose is a trained surgeon; the ovariologist should be unsurpassed in surgical resource and ingenuity. Only skilful and trained hands should follow this calling. He should begin young. Many of the old-fashioned ovariologists were dangerous, they vaccinated babies until they were forty-five or fifty years old, and then began the study and practice of surgery in the abdominal cavity. Sad and sorrowful were the results; such is not the condition of affairs at present. The mortality now is almost *nil* in young and experienced hands, and in patients that are able to move about. The results now are very much better, even in that class far advanced in the process of dying. Again, in a class of cases that they consider too dangerous to touch—I allude to all forms of pelvic inflammatory trouble—a class of cases presented this evening, affording examples of a state of professional ignorance and prejudice which is a disgrace alike to the enlightened time in which we live and to the enormous advances made by the art and science of surgery, we are far indeed from seeing the full application of these advances for the relief of suffering women. This operation saves life and relieves great suffering, restoring the patient to health and a life of usefulness. While one removes diseased ovaries and tubes, the indications present no difficulty. Nor can anyone dispute the propriety of dealing with *pus* cases.

*Secondly*, as to the time of operation. Grave inflammatory troubles should be dealt with as soon as discovered, delay and repeated examinations are dangerous. We dread the delay of a day in *pus* cases.

In conclusion, I will allude briefly to McDowell's work, and this will cover "the where," by giving you a quotation from Dr. R. S. Sutton.

"In the light of all recent advances concerning the environs of an ovariectomy patient, I ask you to listen thoughtfully, and inquire of yourselves: Have modern operators had better environments than McDowell did? Is their quarantine better than his was? Whether accident or necessity or the simplicity of border life provided these conditions so favorable to recovery, your orator will not inquire, but hopes to show that McDowell did operate under conditions as favorable as does Dr. Keith or Mr. Lawson Tait. 1. The patient was refused operation in her own home. 2. She was operated on in Dr. McDowell's own house. 3. History mentions but one assistant present

at the operation. 4. The patient had never been tapped. 5. We may safely infer that the room in which the operation was performed contained, at this early date in Kentucky, no superabundance of furniture or upholstery. 6. That the room was ventilated by an open fire-place is more than probable. 7. The atmosphere was that of a healthy border town. 8. No sponges were introduced into the abdomen. 9. He ligated the pedicle and dropped it in. This operation will stand the criticism of the most exacting specialist of the year 1885 save in two particulars, viz., the ligature was not carbolized or scalded, the ends of it were left hanging out of the lower angle of the wound, and merely turning the woman on the side to permit all fluid to escape from the cavity of the abdomen was scarcely enough in that direction. Pause a moment! Think; at the end of almost three-quarters of a century, the operation stands almost where McDowell left it, with one solitary exception, viz., the ends of the ligature surrounding the pedicle are cut short."

DR. J. M. BALDY said: In a recent number of the *Pittsburg Medical Review*, the editor, commenting upon a report of cases of abdominal section done at the Philadelphia Dispensary, states "that the fact that the operations were performed at the patients' homes with success, should do away with the old idea that the only place to do abdominal section is in a private hospital." The vast majority of operations at the Philadelphia Dispensary have been done at the patients' homes under conditions and surroundings which have been anything but desirable. If the immediate surroundings of the patient and wound are aseptic, the operation can be done with perfect safety anywhere.

In many cases of pyosalpinx if a wealthy woman refuses to take the risk of the knife, she can by proper treatment be made comparatively comfortable without great risk of her life. But the majority of cases of pyosalpinx, even among the wealthy, demand surgical interference sooner or later. If, on the other hand, the patient has to work for her living, and is suffering with recurring attacks of peritonitis, I think that there the operation is called for always. The risks of the operation are comparatively slight. It can be performed by any general surgeon if he has a cool head and good surgical resources.

The use of salines in the treatment of peritonitis is a point of extreme interest. From what I have seen of such cases there is no doubt in my own mind that the treatment by opium is a great mistake. Where there are the signs of beginning peritonitis, the use of large concentrated doses of salines rapidly relieves them. While the use of opium favors the occurrence of adhesions, salines would naturally tend to do away with trouble of that kind. Opium shuts up all the avenues of escape for the products of inflammation and then tends to increase the trouble rather than to alleviate it.

DR. J. PRICE said: I am surprised at what Dr. Baldy has said with reference to pyosalpinx when he realizes how much trouble may come from a little pus. A case of pyosalpinx is always in danger. They suffer constant pain, they fail rapidly and die.

DR. J. C. DA COSTA said: I cannot agree with Dr. Price with reference to pyosalpinx. Others who have had a large experience when asked with reference to their method of treating this affection also differ from him. One gentleman with a large experience in the removal of ovarian tumors has told

me, that he has seen many cases of pyosalpinx but that they had all recovered without operation. My experience is much the same.

Dr. Price says that it is never safe to allow the pus to remain. Let me state two cases. A lady has been suffering for fifteen years. The left Fallopian tube was as large as a small Bologna sausage. She was given the ordinary local and general treatment. One day a little bleb appeared on one side of the uterus. This was opened, and on introducing the sound, it entered five and one-quarter inches. During the next few hours a large quantity of pus was discharged. This patient finally made a complete recovery. Another case: a young married lady suffering with salpingitis, came under my care. The ovary was quite large. Ordinary common sense treatment with rest in bed caused great improvement. She began to go about too soon and had a return of the trouble. At this time the ovary was as large as an orange, but in two months she had perfectly recovered. Would I in this case have been justified in removing the ovaries and thus destroying her hope of ever performing the duties which the Almighty sent her into the world to perform?

In regard to the reports of cases cured by operation that we hear of, the question comes up as to their reliability. I grant that there is not the same mortality after abdominal section for salpingitis and other such troubles as there is after ovariectomy, but even if there is a mortality of even one per cent. the question arises, Is it proper to perform this operation when the patient can be relieved by ordinary treatment? There are in this city a number of hospitals that will take these cases and treat them and cure them, so poverty cannot be urged as a pretext. I believe that the gentlemen who make reports of their cases believe that the report is correct at the time that they make it. But I have had the opportunity of seeing a number of these cases some time after the operation has been performed and the later part of the history of the patient has not agreed with the published report. I will state two such cases in illustration. One was operated upon seven or eight years ago and was reported cured. She is still a nervous, hysterical woman, who cannot sleep without an anodyne, and has a voice like a poll-parrot. In the second case the operation was done several years ago and reported as successful, but the patient was wretched and miserable until a year ago, when she fell into the hands of a quack who cured her.

Why do the reports and the results differ so? The women went to the surgeon in hope of relief, were told "the operation would cure them;" believed it, were operated on, and under the stimulus of hope felt as if they were cured, and that the pains they still felt were due to the operation and would pass away, and so were reported cured. After a while the old pains came back and they realized that they were not yet well, in spite of the operation and published cure. In a number of other cases of women reported well after operation, the least of their troubles was ventral hernia. In opening the abdomen, the operator is very apt to find what he is hunting for, and I have seen extirpated ovaries which were not diseased enough to demand it.

It is not necessary always to remove both ovaries, as is often done in operating for ovarian tumors. I have left a second ovary as large as a lemon and have had no bad results, as in a case operated on about two years ago. The woman has menstruated regularly since the operation and has had no trouble. The ovary has diminished decidedly in size.



DR. M. PRICE said: I would challenge some of the statements made by Dr. Da Costa. He says that salpingitis does not cause much trouble. I can show him a case which has been under medical treatment for five years. Two years ago an abscess burrowed down through the cellular tissue and discharged between the bowel and vagina. This case has been operated on five different times for fistula in ano, with entire removal of the recto-vaginal septum by operations, and until four weeks ago it had not been suspected that it was a case of pyosalpinx. These cases cannot be cured by simple medical treatment. There is no single case that I have seen operated on, which stood one chance in fifty of living six months if the operation had not been done.

DR. W. H. PARISH said: I have no doubt that those who advocate this operation will agree that not all cases of disease of the appendages demand operation. August Martin has said that three-fourths of the cases of disease of the tubes and ovaries do not require operation. There are also cases of gonorrhœal affections of the tube which do not demand the operation. I have seen one case where the inflammation of the tubes followed the occurrence of gonorrhœal inflammation of the vagina, and in which the trouble subsided; the woman subsequently became pregnant.

With reference to the removal of ovaries and tubes that contain pus, I may say that we all know that these cases may continue for years, but suffering from repeated exacerbations of inflammation. These patients are always in danger from the thinning of the tubal or ovarian wall, with the escape of pus, and the occurrence of general peritonitis. If we look over the records of any hospital or board of health, I think that we shall now find few deaths compared with the past, recorded as due to pelvic abscess and general peritonitis. I think that many cases of pelvic abscess and of general peritonitis have been in their origin cases of pyosalpinx. I am strongly in favor of the removal of the tubes and ovaries where there is pus. While a patient may enjoy a certain amount of comfort with pus in the tubes, yet she will be liable to frequent exacerbations, and may have her life placed in great danger at any moment.

I am sure that the operation for the removal of tubes and ovaries in pyosalpinx or ovarian abscess has come to stay, no matter what the future position of the operation for other conditions may be. I think that those who urge the treatment of these cases without operation are doing great injustice to a considerable number of patients, and also no little injustice to the surgery of to-day. My own experience with the operation warrants my endorsement of it.

DR. C. B. PENROSE said: I have only to say, in conclusion, that such tubes as I have shown are useless and dangerous to the woman. They could not permit the passage of spermatozoa or ova. I cannot agree with Dr. Da Costa's statement about abscess of lung or brain. I think it is proper to open an abscess wherever it occurs, and not to trust to nature; and when possible to make a complete removal not only of the pus but of the abscess walls, as we do in pyosalpinx. In cases of pyosalpinx said to have been cured by medical treatment there is always an element of doubt with regard to the diagnosis. Such cases may sometimes occur. But there are few physicians skillful enough to make a positive diagnosis of pyosalpinx before the abdomen is opened. All of the cases on which I operated had had several months or years treatment in the hospitals before the operation was performed.

## GLEDITSCHIN, SPURIOUS AND GENUINE.

BY EDWARD JACKSON, M.D.

[Read November 23, 1887.]

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IN publishing my observations on the action of the so-called steno-carpine (in *The Medical News* of Sept. 3, 1887), I stated:

"In studying the action of this drug, one cannot but be struck with its similarity to that of cocaine. . . . This similarity of action raised in my mind the question, whether this new drug possessed any power which would not be possessed by a solution of cocaine to which had been added a portion of one of the stronger mydriatics, as duboisine or hyoscyamine."

It seemed to me then, however, that the drug did

"possess certain powers, in degree at least, peculiar to it. My impression is that the solution used, said to be a two per cent. solution, is a more powerful anæsthetic than the four per cent. solution of cocaine."

I also thought that while its influence over the accommodation was more powerful than that of homatropine, that the recovery of the accommodation from its effects was more rapid than from any previously known mydriatic, except homatropine.

In this last respect I soon found I had been in error. A few days after that paper was published I came across the records of some experiments which I had made nearly six years ago, and some of the results of which I reported in a paper read before the Medical Society of the State of Pennsylvania in 1882; and among them some trials of weak solutions (1 to 1000 and 1 to 2000) of duboisine and hyoscyamine in my own eyes, where the recovery corresponded exactly to the recovery observed after the use of the alleged new drug. This discovery redoubled my suspicions. I then took twenty-five grains of the solution, dried it over sulphuric acid, and weighed the residue, which I gave to Dr. Henry Leffmann, who dried it still further, and weighed it again; its weight, as reported by him, was 1.62 grains.

This demonstrated that the so-called two per cent. solution of "stenocarpine" was not what it purported to be.

In my paper, before referred to, I objected to the name stenocarpine as probably not indicating the real source of the drug, and pointed out that Mr. Goodman's description of the tear blanket tree corresponded with that of the *Gleditschia triacanthos*, or honey locust; and stated that "extracts made from the leaves of the honey locust growing near Philadelphia, failed to exhibit any anæsthetic or mydriatic properties." About the same time I wrote to Mr. Goodman asking for specimens of the leaves; and he promised them, but they have not yet been received. Soon after this, however, I obtained specimens of leaves from Jefferson County, Texas, which were pronounced those of the honey locust by Dr. J. T. Rothrock, Prof. of Botany in the University of Pennsylvania, who had been the first to suggest to me that the honey locust might be the tree described. These leaves proved as inert as those obtained in this vicinity.

Shortly after this Dr. J. H. Claiborne published in the *Medical Record* of Oct. 1, 1887, a detailed and illustrated account of the honey locust; stating that Mr. Goodman and Dr. Seward had fully identified it as the source of the new local anæsthetic, and proposing, therefore, to call the "new" alkaloid Gleditschine. The publication of the above facts indicating the fraudulent character of the "Stenocarpine" solution was delayed until some of the genuine Gleditschin could be studied. But, simultaneously, Mr. F. A. Thompson, in the *Medical Age* of Oct. 25th, and Dr. John Marshall, in *The Medical News* of Oct. 29th, published analyses of the alleged Stenocarpine—Gleditschin solution, by which the fraud was fully exposed. They proved that unquestionably the solution contained cocaine and a member of the atropine group. The latter is not, however, atropine itself, as might be inferred from their papers; but on account of the brevity of the paralysis of accommodation it produces, must be, I think, hyoscyamine, duboisine, or daturine.

When talking with Dr. Henry Leffmann about the *Gleditschia triacanthos*, he told me that he thought that it had been the subject of investigation by the late Dr. B. F. Lautenbach, who had published something about it in the *Philadelphia Medical Times*. On looking into the matter, I found that in the issue of that journal for November 23, 1878, just nine years ago to-day, Dr. Lautenbach had published a brief communication entitled "Gleditschin—A New Alkaloid," with the promise that "in a later publication this subject will be treated of more fully." The promise remained unfulfilled, doubtless on account



of the early death of this talented, original investigator. But the brief preliminary contribution is of that substantial character which always, sooner or later, proves its value. I make from it the following extracts :

“When, however, an alcoholic extract of the unripe seeds and the portions of the fruit immediately surrounding these (the remainder of the unripe fruit is practically inert) was used, very active poisonous effects were observed. In from five to twenty minutes the frogs were in a profound state of stupor. No reflex movements could be excited by any of the known means, though at that time the motor nerves still remained irritable. This loss of reflex activity was not due to loss of function of the sensory nerves through the direct action of the poison on these structures, as, after ligature of all the bloodvessels of a limb, irritation of that limb failed to produce reflex movements when the animal was poisoned with the extract. The heart continued to beat for hours after these symptoms appeared. If a not too large dose was given, the animals recovered after being in this state for twenty-four hours.” . . . “To isolate the active principle the portions of the fruit used were digested in absolute alcohol and ether, tannin precipitated with lime, and the alkaline filtrate neutralized with dilute sulphuric acid. The dense precipitate thus obtained was allowed to crystallize. The crystals were dissolved in water, and the alkaloid precipitated by lime.” . . . “The crystals which were obtained were elongated rhombs, almost completely insoluble in water, but readily soluble in alcohol. They leave no ash when heated on platinum. The alcoholic solution is alkaline, and with dilute sulphuric acid gives a dense white precipitate, . . . composed of elongated rhombic crystals, whose angle, however, was much smaller than that of the Gleditschin crystals. Both the original crystals and the sulphate produced in frogs and toads the symptoms before described.”

“Gleditschin, as I propose to call this new alkaloid, forms salts with sulphuric, nitric, hydrochloric, acetic, and tannic acids. All these salts crystallize in modifications of the rhomb.” . . . “The first symptom produced in frogs is a state analogous to sleep. Following this rapid abolition of reflex activity takes place, and respiration ceases. The galvanic irritability of the nerves is much diminished.”

After reading this account by Dr. Lautenbach of the substance clearly entitled to the name Gleditschin, I endeavored to obtain some of the unripe fruit, in which, according to Dr. Lautenbach, the drug is to be found. With some difficulty and after considerable delay, a peek of the fruit was obtained, but the pods and seeds were most of them very nearly mature. However, Mr. James A. Kyner, Demonstrator of Chemistry in the Polyclinic, following in the main the method of Dr. Lautenbach, obtained from them a very small amount of a solution of what we believe to be the sulphate of the true Gleditschin. On evaporation it deposits crystals of a narrow rhombic form. When ammonia is added it gives a precipitate, which presently crystallizes in

broader rhombs. On the frog it produced the symptoms narrated by Dr. Lautenbach, though my supply of the solution gave out before the stupor was complete. The symptoms reached their height in fifteen minutes after the hypodermic injection of the solution, were passing off in an hour, and had disappeared entirely in less than three hours. *This solution freely applied to the conjunctiva produced no anæsthesia, or dilatation of the pupil, whatever.*

The analyses and tests above referred to, with several others that have since been published, have pretty well disposed of the alleged new local anæsthetic and mydriatic; and Gleditschin has lost its interest for the ophthalmic surgeon. But the incident, disagreeable as its ending may have been to some of us, is not without its useful lessons.

*First.* It is shown that such a fraud cannot be carried far even with a drug as difficult of positive chemical identification as cocaine. And every such attempt at fraud can only make more brief the period, and decrease the profit, of succeeding attempts.

*Second.* It has been demonstrated that cocaine can produce anæsthesia through the unbroken skin; although, as I have pointed out (*loc. cit.*), this is extremely superficial; and

“To make a painless incision in tissues anæsthetized in this way, one must do it by repeated superficial cuts with the knife, keeping all the time the cut surface bathed with the solution.”

*Third.* Attention has been drawn to the *Gleditschia triacanthos*, and the genuine Gleditschin discovered and studied nine years ago by Dr. Lautenbach, but recently in a fair way to be forgotten. And in the direction of a further study of this substance lies the probable path of profitable future investigation. The leaves have been proven practically inert, and for several months it may be impossible to obtain specimens of the unripe fruit. But other parts of the plant might be tested for it. In the *Medical Age* of November 10th Dr. Crull states that he has cured gleet with a decoction of the bark of the root of the thorny honey locust (the more common variety), and that taking a tablespoonful of the decoction himself

“caused nausea, giddiness, dimness of sight, cold perspiration, and a prickly or smarting sensation of the tongue and throat. These symptoms continued for nearly three hours, when they gradually abated. The evacuation of the bowels the following morning was very bilious and watery.”

## EXHIBITION OF INSTRUMENTS AND SPECIMENS.

DR. J. PACKARD exhibited a case in which were conveniently arranged the various articles required in the application of antiseptic dressings.

DR. J. M. BALDY presented a

### FIBROID TUMOR WITH A FIBROID UTERUS.

The patient from whom the tumor was removed was a woman between the age of forty and forty-five years. She had carried the tumor for a number of years and had gotten along comfortably until last spring, when she says that she suddenly felt something slip back in the abdomen. After that she had pains in the legs and the abdomen began to swell. The legs also became œdematous. She was tapped in July, and since then has been tapped eight times by her physicians. The operation was repeated toward the last, every ten days. I performed abdominal section one week after the last tapping, and at the time three gallons of fluid escaped. The urine contained pus and albumen, but no tube casts. Heart was in good condition. General health failing rapidly. The ascites was attributed to the pressure of the tumor.

The operation was performed thirteen days ago. The tumor was first removed by enucleation from the fundus of the uterus, then the broad ligaments having retracted, a Kœberle nœud was thrown around the uterus at about the internal os. The pedicle was treated by the extraperitoneal method. A glass drainage tube was introduced. The peritoneum was found to be enormously thickened. Since the operation a large quantity of serum has escaped through the tube, over one quart a day. The patient had an acute attack of local peritonitis resulting from pressing with both hands on the tube when coughing. She was treated with salines, and the peritonitis rapidly disappeared. At the same time the discharge from the tube was abruptly discontinued, having dropped in eight hours from three half pints to as many drachms, and has so continued for the last two days.

The points of interest in the case are: the woman's age—although near the menopause, she could not have possibly lived long enough to hope for any relief in this direction; the large amount of serum discharged from the drainage tube, and its sudden stoppage; the possibility of carrying so large a tumor for years and only suddenly beginning to suffer from it; the enormously thickened peritoneum.

The case well illustrates the folly of repeated tapplings.

DR. H. A. SLOCUM exhibited a specimen of

### PLACENTA PRÆVIA IN SITU.

The patient was pregnant for the thirteenth time. After meeting with a fall, she suffered with frequent profuse hemorrhages of short duration. The bleeding occurred at irregular intervals, and there was no complaint of pain. When seen, on the occasion of the last hemorrhage, a tampon was applied, as the patient was so weak that it was not thought advisable to accomplish immediate delivery. The patient, however, did not rally, but died from exhaustion twelve hours later.



## PERI-CÆCAL INFLAMMATION.

[Discussed December 14, 1887.]

### MORBID ANATOMY.

By J. H. MUSSER, M.D.

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MUCH confusion appears to exist in regard to the nomenclature of the inflammatory affections of the region we are about to consider. It may, therefore, be well to state the meaning of the various terms which will be used in this discussion. By typhlitis we shall understand inflammation of the cæcum; by peri-typhlitis, inflammation of the peritoneum covering the cæcum; by para-typhlitis, inflammation of the connective tissue behind the cæcum. The term typhlitis is often used to include inflammation both of the cæcum and of the appendix. We shall, as suggested by Dr. Fitz, use the term appendicitis for inflammation of the appendix, appendicular peritonitis for typhlitis of the appendix and its serous covering, and para-typhlitis for inflammation of the connective tissue around the appendix, or, if you please, peri-cæcal.

It is well to know the relative importance of the inflammatory affections in this portion of the intestinal tract. Typhlitis has been considered by systematic writers to be a frequent affection, and yet it is difficult for pathologists to find records of post-mortems in which this condition has been found.

It is true that some writers, especially the Germans, have described cases, particularly of stercoral typhlitis, in which inflammation and ulceration of the mucous membranc of the cæcum, by pressure from fecal impaction, was present. Most of us will, however, agree with Fagge that typhlitis is a good general expression used for all varieties of inflammation occurring in the right iliac fossa, but that in the majority of cases the correct term should be appendicitis. Fagge relates a case of Williams' in which the patient had all the symptoms of peri-typhlitis with a tumor in the right iliac fossa. He was

recovering from this when an acute affection of the pleura caused his death, and at the post mortem there was found appendicitis, with ulceration and perforation, and not typhilitis.

Dr. Wilkes agrees with Fagge in this view, and they consider that the difference in degree of the inflammation alone accounts for the difference in the symptoms, and that the largest number of cases are due primarily to inflammation of the appendix.

That inflammation may occur in the cæcum as it may occur in any other portion of the large intestine no one will deny. But we can say from the records of Dr. Fitz that perforation of the cæcum is most rare, for in a most extensive research he was able to find but three cases, and in these instances, due to foreign bodies. We shall, therefore, with Fagge, consider that appendicitis is the real affection that occurs in the region we are discussing (see Appendix, I.).

A word with reference to the anatomy. The cæcum normally varies much in position as well as in shape. On the blackboard are drawings of different forms of the cæcum, as detailed by Treves in his lectures on the anatomy of the intestinal canal. He thinks that the cæcum is most frequently found, not in the right iliac fossa, but on the psoas muscle itself, or in the pelvis; that the cæcum is entirely surrounded by peritoneum rather than only partially, and, therefore, that behind there is no areolar tissue as was described by the older anatomists. He does not believe, moreover, that there is a meso-cæcum.

It is also of importance to note variations in the appendix in the consideration of peri-cæcal inflammation. The usual position, as found by Mr. Treves and by Dr. Fitz, is behind the ileum and its mesentery, with the tip pointing toward the spleen. The second most usual position is behind the cæcum with the tip pointing upward. Long appendices usually take this upward direction. Fitz also refers to its lying on the psoas muscle with or without the tip in the pelvic cavity. There are other variations in position.

It may stretch across the pelvis and become adherent to the sigmoid flexure of the colon, and in one instance I have seen the appendix in the inguinal canal associated with hernia. In another instance it was adherent to a pyosalpinx (see Appendix, II.). The appendix varies in size, it varies as regards the character of its walls, and it varies as regards its contents. It may vary in length from one and one-fourth to nine inches. There is a famous specimen in which the appendix was nine inches in length. It lay behind the colon, reaching to the under surface of the liver (see Appendix, III.). In cases dying from causes

not associated with this region, the appendix is often found as a cord-like body, having been the seat of previous inflammation. It may have a dilatation either at its blind extremity or in some portion of its length, especially pouch-like at the mouth. Sometimes the entire canal is dilated and filled with catarrhal products.

The character of the contents is of importance. Various articles have been found in the appendix, but chiefly fecal masses. Seeds of various kinds, buttons, bristles, worms, shot, pins and gall-stones have also been found. It is in all probability on account of the presence of these foreign bodies that we have the serious secondary symptoms that arise (see Appendix, IV.).

I shall next speak of the morbid anatomy of peri-cæcal inflammation. First, with regard to the manner of making a post mortem in such a case. There is usually an extreme degree of peritonitis, and unless the post mortem is made with great care, it will be impossible to find the seat of perforation, if one exist, and the exact conditions and relations of the peri-cæcal inflammation. The easiest method is to begin at the first loop of intestine that is reached and from that unravel the intestines, separating with great care the adherent parts. If a source of obstruction is found, tie the bowel on both sides and examine the portion in situ, turning the gut if necessary. Such an examination is absolutely necessary in order to make a thorough study of the part.

Inflammation of the appendix occurs both of the simple catarrhal and of the ulcerative type. That we have catarrhal inflammation we know from the lessons of morbid anatomy. Clinically, it would be impossible to determine the presence of such an inflammation, however. Catarrhal inflammation with succeeding ulceration, local peritonitis, and, finally, perforation, also occurs; and the following conditions are generally found after death. In the first place, on section of the abdominal walls there is found, especially in the right iliac region, an œdematous state of the tissues; not only may there be serous œdema, but there may also be infiltration of pus, due to the burrowing from the primary abscess. The peritoneum, if involved, will exhibit an intense degree of inflammation with the characteristic injection, sometimes general, sometimes limited; and more particularly to the right iliac fossa and the pelvis (see Appendix, V.). Serum will be found in the peritoneal cavity, and in some instances pus; blood is occasionally found. In the more severe forms, especially, large flakes of lymph cover the intestines, the parietal peritoneum, and the abdominal organs. The intestines are also more or less adherent to each other, depending upon the duration and the degree of the inflamma-



tion. The location of the abscess, for it is usually circumscribed, depends upon the position of the cæcum. There are three positions in which it is most frequently found—either in the right iliac fossa just above Poupart's ligament, or behind the cæcum, or in the pelvis. In a case which recently came under my observation, the abscess was found in the pelvis, one and one-half inches below the level of the psoas muscle, four inches from the anterior superior spine of the ilium on the right side, and two inches from Poupart's ligament. In another case the abscess was found behind the cæcum in the connective tissue of the right iliac fossa. The size of the abscess varies, sometimes containing only two or three ounces of pus, and in other instances as much as a pint or more has been removed. The walls of the abscess differ according to its position. In the first instance mentioned the upper wall was made up of the cæcum, the right of the pelvic wall, while posteriorly and on the left it was circumscribed by the adherent intestine. The walls of the abscess may be made up by the intestines alone. The appendix is always found in the abscess, and has undergone changes varying in degree with the duration and severity of the inflammation. Inflammation and ulceration of the mucous membrane, serous or purulent infiltration of the walls, with perforative ulceration and encysted or localized peritonitis, are discovered. In some instances a portion has sloughed entirely off and cannot be found, having undergone dissolution; in others it is found as a soft mass of necrosed tissue (see Appendix, VI.). The perforation varies in size; sometimes it completely surrounds the appendix, or even severs it in two, or it is sufficiently large to admit a probe only, while even in other instances it can scarcely be detected. Sometimes two or more perforations are found, and frequently they are covered by recent lymph. The canal of the appendix is very often dilated. We usually find in the canal, near the cæcum, a foreign body; it may, however, be found in the abscess. In the cases detailed by Dr. Fitz, foreign bodies were found in sixty per cent. In other cases their presence or absence could not be positively determined, from haste at the autopsy, from their disintegration, or from their discharge into the bowel, so that the proportion is probably larger than stated. There is one point of importance in reference to the surgery of this region, and that is, that the perforation usually occurs within one and one-half or two inches of the colon. Whatever may be the length of the appendix, the perforation is as a rule found at the point just indicated.

There are, of course, many cases which do not terminate fatally. Under such circumstances resolution takes place, or the abscess

becomes encysted, or the abscess ruptures into some neighboring organ. Dr. Bernardy related a case to me where rupture occurred in the upper portion of the rectum and also through the abdominal wall at the umbilicus. Dr. Edwards had a case in which fully one and one-half inches of the appendix had sloughed off; the abscess ruptured into the bowel, carrying with it the portion of the appendix and a mass of grape seeds, which were discharged together. The abscess may discharge through the abdominal wall, through the scrotum, into the hip-joint, through the loin or the perineum, or in other directions. Sometimes the pus burrows upward, even as high as and into the pleural cavity. I may say that the bladder is a favorite seat for the rupture of such abscesses.

That cure may take place in cases of perforation of the vermiform appendix, this specimen distinctly shows. It was prepared by Dr. William Pepper, and is in the museum of the Pennsylvania Hospital. The patient died of another affection. The appendix was cord-like, except in one place, where an old perforation was seen, with organized blood-clot and lymph on the surface.

These are the chief points in regard to the morbid anatomy of peri-cæcal inflammation. In the first place, that peri-cæcal inflammation is due to the inflammation, ulceration, and rupture of the appendix vermiformis with the secondary formation of an abscess; that the position of the abscess depends entirely upon the position of the appendix; that the further course of the abscess cannot be determined; that in the larger number of cases the inflammation and ulceration are due to the presence of a foreign body occluding the canal—a retention inflammation. The sequence of events appears to be as stated; and while it may appear to be a refinement of terms to differentiate between typhlitis and appendicitis, it is almost necessary in order that a correct and well-defined appreciation of the pathology be determined, so that early and proper treatment may be instituted. Unless such a refinement be made, cases of this kind will be frequently treated as simple typhlitis, whereas in ninety per cent., or perhaps a larger proportion, they are cases of inflammation of the appendix.

#### APPENDIX.

The following notes are presented explanatory in a measure of the text. They are based on the appearance of the specimens the writer had on exhibition at the meeting, collected from private sources and from hospitals. Some twenty specimens were obtained for this purpose. The writer's best

thanks are due to Drs. Pepper, Edwards, Bernardy, Willard, Woodbury, Longstreth, Hinsdale, Seltzer, Daland, Bodamer, and others, for notes and specimens. Some excellent descriptions may be found in the Catalogue of the Museum of the Pennsylvania Hospital.

I. Strictly speaking, we should say the sequence of typhlitis, perityphlitis, and peri-cæcal abscess occurs but rarely. A typhlitis and perityphlitis, no doubt, are seen clinically, but the cases do not come to the post-mortem table unless perforative appendicitis occurs conjointly. For this reason, and because a similar sequence of lesions does not obtain in similar inflammations of the large bowel under like circumstances, as fecal impaction from stricture, or from paresis in the aged or after typhoid fever, the pathologist may well doubt the existence of perityphlitis and succeeding peri-cæcal abscess. In the more violent inflammations of the gastro-intestinal tract, in gastritis, enteritis, or in dysentery, such sequential lesions are not found.

II. *Case I.*—Matilda Thomas, aged one hundred and four years. Cause of death, exhaustion from strangulated hernia. Abstract from autopsy record, Philadelphia Hospital. Abdominal cavity: no effusion; adhesion of large and small intestine; appendix dilated to size of first finger, end of it incarcerated in inguinal canal, with portion of meseutery and small intestine; so much post-mortem discoloration, could not determine color of parts; local peritonitis; in canal and layers of muscles and fasciæ considerable amount of greenish pus; the portions outside of canal adherent to the bladder, uterus, and ovary, the latter being included in the inflammatory mass. Organs occupy normal position. (Musser.)

*Case II.*—Philadelphia Hospital. Female, aged twenty-two years. Appendix four inches long, dilated to size of finger, contained mucoid fluid, adherent to a large pyosalpinx.

III. From Museum of Pennsylvania Hospital, described by Wistar. (See a Catalogue of Pathological Museum, 1869.)

IV. Cranberry seeds (Mears). Fecal concretions (Hartshorne, Daland, Hinsdale, Seltzer, Musser). Grape seeds (Edwards, W. A.). A concretion one-half inch long and one-quarter inch thick, cone-shaped, apex pointing toward the perforation in the appendix, base concave, firm, fecal color and odor, in mass of which black bodies, size of cranberry seed, were found. It completely occluded the canal, causing retention of the natural secretion, inflammation, ulceration, etc. The perforation was one-eighth inch from the apex of the concretion (Musser). A phosphatic concretion in Mütter Museum (Woodbury).

V. General peritonitis (Woodbury, Willard, Hall (Mütter Museum), Bodamer [Case I.], Seltzer, Pepper [1637 Pennsylvania Hospital Museum], Longstreth [Pennsylvania Hospital Museum Catalogue, No. 1368<sup>10</sup>], Meigs [Pennsylvania Hospital, 1366], Bernardy, Musser). Local peritonitis (Mears, Pepper, Hinsdale, Bodamer [Case II.], Hartshorne, Musser).

VI. Two inches of the appendix necrosed, slate-gray color, soft, floated in the pus, attached slightly to the healthy stump (Musser). Appendix sloughed off. Male, forty years. Peritonitis fourth day (Bodamer, Case I.). Appendix one and a half inches long, ulceration one inch from bowel, a few lines in diameter. No communication between appendix and cæcum. Gelatinous mass in appendix (Bodamer, Case II.). Appendix removed by amputation,



was attached by its blind extremity to omentum, also removed. Length two inches, one inch occluded by concretions, and one dilated and empty (Woodbury, Mütter Museum). Appendix two and a half inches long. Ulceration three lines in length and two inches in width, half an inch from extremity. Canal not dilated. Walls not thickened (Willard).

Mütter Museum, College of Physicians of Philadelphia, A. D. Hall. Vermiform appendix, cæcum and portions of ileum, perforation, peritonitis; death. When recently examined a perforating ulcer of the appendix was found, through which a grooved director could be passed, communicating freely with the peritoneal cavity. There are two perforations, one, 2.5 centimetres, from the caput coli; the muscular coating of the appendix appeared to have been destroyed by ulcerations, and then the peritoneal coat had given way in three small openings about 2 millimetres in line. These were arranged in a triangular manner. The second was a solitary perforation, 4 centimetres from the end of the appendix. Although thick patches of lymph had been thrown out, no attempts to limit the effusion of foreign material by lymph barriers was discoverable. There was nothing to show that any foreign body or concretion or impaction had been the origin of the lesion. Fluid pus was found in the interspace between liver and stomach, and about six ounces of turbid serum were in the pelvic cavity. The intestines were glued together.

Mrs. C., aged twenty-five years, mother of two children, youngest four months old. Death on fifth day of idiopathic peritonitis, with characteristic symptoms.

Catalogue of Mütter Museum, College of Physicians, E. Hartshorne. Appendix, gangrene and perforations. Recently observed the appendix was inflamed and greatly enlarged, and intimately adherent to surrounding parts; was distended to a sac 5 centimetres long and 2 centimetres broad, and communicated by a small opening with the cavity of head of colon; walls thickened, infiltrated with dark blood and serum; its peritoneal coat highly injected and covered with exudation, and the mucous lining showing traces of extensive inflammation, which had run into a superficial gangrene. The latter had produced a honeycombed appearance of the inner surface, and had covered it with a dark greenish, pulpy, and extremely fetid matter. On its side, about two-thirds of the distance from the cæcal extremity, an ulcerated perforation, some 6 lines in length and 3 lines in width, was found, from which fluid fecal and other matter had been flowing in small quantities. Immediately behind this opening, and encased by the appendix, a peculiar, moderately hard concretion, of the shape and color of an elongated olive stone, presented itself, having been apparently moulded by the cavity by which it was contained. This was in layers, and was probably hardened fecal excrement which had accumulated by slow oozing of the fluid contents of the large intestine through the small orifice of the distended appendix. No other evidence of morbid action in abdominal cavity, except congestion and œdema of ovaries and fimbriated tubes. Death on the fifth day from peritonitis.

## DIAGNOSIS.

BY WILLIAM PEPPER, M.D., LL.D.

I FEAR that the remarks that I shall make may seem vague and desultory, for it is difficult to compress what is to be said within the very reasonable limit assigned. I am quite willing to accept the terms suggested by Dr. Musser, but I do not think that the term paratyphlitis, as indicating inflammation of the peri-cæcal connective tissue, is likely to gain general usage. It is probable that the term peri-typhlitis will continue to be used to indicate inflammation of the walls of the cæcum and of the neighboring connective tissue. Still, anatomically and for parity of nomenclature, it may be well to recognize paratyphlitis, as indicating inflammation of the peri-cæcal connective tissue.

The anatomical points made clear by Dr. Musser are very striking. I would merely add to these one or two facts. In the first place, the appendix presents evidences of disease in a very large number of indifferent autopsies. I remember the report of a series of three hundred autopsies, in which there were signs of disease of the appendix in thirty-three per cent., although in none of these was there a history of typhlitis. We have this little organ, singularly useless physiologically so far as we know, placed in a singularly unfavorable position anatomically, very liable to become impacted, so formed that escape of its contents is very difficult, and very prone to become diseased. We must recognize the fact that the appendix is often diseased when we have no reason to suspect such a condition. I cannot agree, however, that the cæcum also is not often the seat of disease. In a long experience in which I have paid much attention to these cases, I have collected a number of instances of independent cæcal disease, where the cæcum alone presented lesions, sometimes going on to chronic inflammation, ulceration, and perforation. The real condition of things seems to be this. In the first place, there are many cases of mild appendicitis which cannot be recognized during life; in the second place, there are a considerable number of cases of typhlitis where the symptoms are chiefly due to inflammation of the walls of the cæcum and of the peri-cæcal connective tissue, which end in recovery. It is impossible in these cases to determine what proportion has been due to appendicitis. Finally, there are also a good many cases of severe appen-

dieitis resulting in ulceration and perforation, with the formation of circumscribed abscess or of general peritonitis. If we could accept the view that perforation of the appendix, leading to peri-typhlitis or para-typhlitis, often resulted in recovery by resolution, it would be a matter of comparative indifference where the lesion was chiefly situated; but do clinical experience and anatomical records justify the view; that perforation of the appendix, followed by peri- and para-typhlitis, often ends in resolution? It is true that I have found one specimen and that others have been placed on record where perforation of the appendix has not been followed by grave results, but do these amount to anything comparable with the great mass of cases where lesions of the appendix have occurred with peritonitis and fatal result unless relieved by operation. It seems to me that we have to recognize that while in typhlitis, peri-typhlitis, and para-typhlitis, in all probability appendicitis always exists, yet it is often present in only a very mild degree, and can cause only a small portion of the symptoms. This conception seems necessary to a correct diagnosis of these lesions; it is necessary in guiding our treatment.

There appear, then, to be two classes of cases. In one the affection is more limited to the walls of the cæcum and the peri-cæcal connective tissue, and the appendix is affected to a comparatively slight degree. We have no record as to the frequency of such cases. The record is not to be sought on the post-mortem table, for the large proportion of these cases if properly treated from the beginning end in resolution. I have the records of scores of such cases, the vast majority of which ended in resolution. I think the experience of those I address would give a large number of cases of inflammation in the cæcal region so terminating. So large is the number that I cannot consider that in any large proportion of them did perforation of the appendix occur. As I have seen them, these cases are marked by pain as the initial symptom, not excruciating in character, not associated with evidences of collapse, often accompanied with nausea and vomiting, and with elevation of temperature, which continues to rise until decided fever is present. With these symptoms there is excruciating tenderness in the right iliac fossa, a sense of fulness and induration, not rarely with dorsal decubitus and flexed thigh, with a constipated condition of the bowels possibly preceded by one or two irritative movements during the first day, and with these there is considerable acceleration of the pulse. In proportion as the induration and swelling is early and marked, it has seemed to me that the chances are that the appendix is not seriously involved, but that the affection is chiefly one of inflammation of the



walls of the cæcum and of the peri-cæcal connective tissue with exudation, and I have no doubt usually accompanied with considerable fecal impaction of the cæcum.

If absolute rest be insisted upon, if abstinence from food and absolute avoidance of interference with the state of the bowels be adhered to, if local depletion be employed, if counter-irritation followed by the application of the ice-bag, or warm fomentations be employed, and if the internal use of opium and mercury be begun early, the vast majority of such cases terminate in resolution and complete recovery if the convalescent is properly treated—that is, if these restrictions be insisted upon until the sensibility of the part is entirely removed. I am satisfied that the well-known tendency to the recurrence of typhilitis is largely dependent upon the management of the convalescence from the primary attack. Such would seem to be the diagnostic marks of this type of case.

On the other hand, we know very well that such cases not rarely go on without resolving, that the induration extends, that the symptoms become aggravated and possibly are such as to indicate suppuration, and that at periods varying from seven to fifteen days pus formation occurs. Such cases demand operative interference, and are successfully treated by the Parker operation. The existence of pus can often be demonstrated by exploratory puncture with a fine aspirator needle.

There is a second class of cases of an entirely opposite character, with which we are all equally familiar. Here the patient may apparently have been in almost perfect health, for perforation of the appendix may occur without any previous symptoms of which the patient had complained. But in these cases there has been a catarrhal appendicitis; the fecal matter which is present in nearly every healthy appendix, is no longer able to circulate and escape, because the outlet is partially closed by the swelling of the mucous membrane; the pent-up secretions and the irritating fecal matter excite more serious inflammation in the walls of the appendix; ulceration is established, and finally perforation occurs, and the symptoms of the attack begin. I have rarely seen a fatal case of disease of the appendix where there was not stenosis of its orifice. I think that, to a large extent, it is this tendency to closure, and the accumulation of the secretions and of fecal matter, that causes the more serious type of inflammation and the occurrence of perforative appendicitis.

The first symptom in these cases is usually intense and excruciating pain, so severe at times as to cause collapse, occasionally so severe as

to be followed by death in a few hours. Following this there is the rapid development of the signs of peritonitis. The pulse becomes frequent. There is marked tenderness, not in the iliac region only, but also toward the middle of the abdomen. The belly becomes distended, but there is no induration to be felt; there may even be no fulness in the right ileo-cæcal region. The appendix often lies under the cæcum, and I have frequently percussed these cases with great care without finding any evidence of dulness or of induration. After the occurrence of the initial pain, the fever may not rise very rapidly. There may be only moderate febrile reaction for one, two, or three days, associated with continued, moderate pain simulating an ordinary catarrhal attack with intestinal colic. For two or three days these cases may be viewed as not being seriously ill, so delusive may be the symptoms after the subsidence of the initial pain. In these cases there is absence of ileo-cæcal infiltration, or induration, or tumor, or prominence, or dulness on percussion. There is in these cases a less degree of vomiting than in the first class of cases mentioned. The vomiting is often rare, and only induced when the stomach is taxed. The bowels are quiet, but not so obstinately constipated and not so strongly resistant to the action of laxatives as in typhlitis, with more or less impaction of the cæcum. After a time which varies with the intensity of the attack and the direction which the exuded matter has taken, there appear the symptoms of a rapidly spreading, general peritonitis. The belly becomes greatly distended and tender, and the coils of intestine are outlined through the tightly stretched skin. The vomiting becomes frequent, the temperature rises, the pulse grows thready and rapid, and we have the familiar signs of general peritonitis. These cases end fatally, from exhaustion, in from five to ten days.

Here are two groups of cases which seem to me to differ not only in degree, but also to differ in the seat of their lesion and the character of that lesion. I cannot believe that in any great number of cases of the first group there is perforation of the appendix. Yet, unless perforation is present, we have seen that all the other lesions of the appendix may exist without the production of any symptoms. Therefore, I cannot attribute to ordinary appendicitis the symptoms of peri-cæcal inflammation which mark the first group of cases. These symptoms we must assign to the inflammation of the walls of the cæcum and of the peri-cæcal connective tissue in chief part.

It is, therefore, of momentous importance that we should be able to diagnose the sort of case that we have to deal with, and that at the

earliest moment. I should say, that in proportion as the tumor, prominence, induration, and dulness are marked, delay is safe, especially if rectal examination—the mention of which I have postponed until the last—does not indicate any fulness on the right side of the roof of the pelvis. If this is present, it indicates an amount of exudation which will end in abscess, and is a strong indication for operation. If digital examination, pushed if necessary to the extent of the introduction of the whole hand, reveals no fulness in the roof of the pelvis, I think delay for several days is justifiable, and with such treatment as I have indicated, the symptoms will, in the majority of cases, subside; and although the case is fraught with great anxiety, resolution will begin, the symptoms will become milder, and the patient recover, and under proper treatment the part will be restored to absolute health without relapse. Even if frequent relapses occur—and I have seen as many as fifteen or eighteen in the same individual—complete recovery may follow a protracted course of treatment with absolute rest, rigidly restricted diet, constant counter-irritation, and suitable alterative treatment internally.

Of course if, after waiting a few days, there is no evidence of the commencement of resolution; if the fever is sustained, particularly if it assume a hectic type, we know from experience that suppuration will not be long postponed. Exploratory puncture should be made, and operation should follow without delay.

The most important question to be considered is, What is the earliest moment that we can establish the diagnosis? On account of the shortness of the time, I limit myself to the differential diagnosis between the two forms of cæcal inflammation to which I have referred. The initial symptoms give us some indication of the seat and the gravity of the attack. Typhlitis and peri-typhlitis soon offer demonstrable symptoms, but as the appendix is hidden under the intestine, the symptoms of perforated appendicitis are often obscure for two or three days. The most careful palpation may fail to show the slightest fulness. The patient may complain of pain over the cæcum, or over the hypogastrium. External examination does not aid us in the diagnosis. Are there any special features which will help us? I would again refer to the importance of the rectal examination. Early and oft-repeated rectal examination is the most important diagnostic means we possess in this class of affections. Often, on opening the body after death, there is no appearance of peritonitis in the exposed coils of intestine. There is no inflammatory process seen outside of the cæcum, and nothing is found until the cæcum is lifted up, when it



is discovered that the inflammation is behind it, and extends downward to the pelvis. Sometimes, on removing a layer of lymph, you disclose the pelvis filled with pus. In such cases, if rectal examination should give a sense of distention of the right side of the pelvic roof, might not a puncture be made with a curved exploring needle introduced through the rectum? This has suggested itself to me, although I have never tried it. In this way we might demonstrate the presence of pus, when it would not be possible to do so through the external abdominal wall.

In many of these cases there has seemed to be an unusual abundance of urine and an increased frequency of urination. I think that the former is associated with the absence of vomiting. In typhlitis and peri-typhlitis, there is often so much vomiting that very little liquid is absorbed, and the urine becomes concentrated. I have seen cases of perforation of the appendix, where the urine was voided at intervals of an hour or an hour and a half, the total amounting to a large quantity.

Again, it has seemed to me that in perforation the pain is more apt to extend to the middle line of the abdomen, and sometimes into the genitals, especially into the right testicle and spermatic cord.

The agony of pain which marks the initial lesion, the development of fever, the acceleration of the pulse, the distention of the abdomen, the pain referred to some point in the ileo-cæcal region, the comparative rarity of vomiting, the absence of induration and tumor, possibly, the ability to detect fulness or induration in the roof of the pelvis by rectal examination, the frequent micturition with a free supply of urine, the pain possibly radiating in the direction of the genitals, have, I think, been in the majority of cases the most marked symptoms.

Suppuration occurs in these cases very early, even earlier than in the other group of cases. In one case in which Dr. Keen operated for me as early as the close of the third day, perhaps the earliest operation on record, a pint of pus was found in the pelvis.

So much for the suggestions that I am able to offer with reference to these important affections. The point to which we should bend our exertions should be to determine the early diagnostic symptoms of these two varieties of cæcal inflammation to see whether there is a constancy in the description that I have given of the first type of inflammation of the walls of the cæcum which, under proper treatment, offers a considerable hope of recovery. We should, in par-

ticular, strive to point out the indications for operation in the two classes of cases.

I would ask if general peritonitis may not be a positive indication for instant operation. It has been asserted that general peritonitis is not a contra-indication to laparotomy under other circumstances. If this is the case, the development of general peritonitis in a case of inflammation of the cæcal region would at once indicate operation, for after this develops death results under medical treatment.

I will not take up the question of the diagnosis of these affections from intussusception and internal strangulation. Although this would be necessary for a comprehensive discussion of the subject, the time at our disposal will not permit it on the present occasion.

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### TREATMENT.

BY THOMAS G. MORTON, M.D.

FOR practical purposes the treatment of peri-cæcal inflammation must be divided into two subdivisions, that of the pre-purulent, and that of the post-purulent stage; or, 1st, before formation of pus or of appendix perforation; and, 2d, after that event.

The treatment of the pre-purulent, irritative, or simple inflammatory disorders of the cæcum and its surroundings, or appendix, should consist of rest in bed, restriction of diet to nourishing liquids, hot poultices or fomentations frequently replaced upon the parts, perhaps local depletion, and possibly the hypodermatic exhibition of morphia to control pain; whilst the bowels should be kept open and free from accumulations of gas and feces by the administration of salines and enemata—perhaps with the addition of turpentine to the latter.

Those disposed to cavil at the advice just given, I would ask: Shall we keep the bowels in liquid condition, and so best prepared to resist peritonitis, should it occur, whilst at the same time the mere draining of fluid from the intestines and surrounding parts would influence for the better the peri-cæcal inflammation? or shall we paralyze and congest, and inflate the bowels by the old-fashioned "splinting" treatment, and thus beckon on peritonitis?

Pain of intense character would often be as much an indication for operative relief as for morphia.

Prompt resolution should take place in cases which are not to go on to the stage of pus formation; and very long continuation of symptoms, or relapses, or recurrences, would be strong indications for surgical interference.

The presence of such tedious recovery, relapse, or recurrence would point to the probable presence of conditions exceedingly dangerous to the patient from liability to general peritonitis or perforation at any time; they further would point, as a rule, to the appendix as the source of irritation and danger. Indeed, in man, that worse than useless appendage must be regarded as the root of most evil in the region under consideration.

To illustrate this point by a single impressive instance, let me quote a case which was reported for me in the *Philadelphia Medical Times* of June 11, 1887. It was that of a woman who, for a long time, had been having mild attacks of abdominal pain, located in the region of the cæcum, which had usually yielded with great promptitude to anodynes. During the course of the last attack of that nature, violent symptoms of perforation and general peritonitis came on. I did not see her until two days after this unfortunate accident; but, though she was then in a most desperate condition, I advised operation as her only chance, and forthwith performed abdominal section. The appendix was found perforated in two places, and violent general purulent peritonitis going on. She died a few hours afterward, but I felt better satisfied that the operation had been performed.

Coming now to our second division, suppose the process to have gone beyond the simple, inflammatory stage, and the presence of pus, even a few drops, to have been diagnosed.

In the great majority of instances, the presence of even a minute amount of pus so near to the peritoneum would be of vastly more risk to the patient than abdominal section for its relief. Hence, I should operate whenever the diagnosis of pus had been made—occasionally even without positive diagnosis. But in this paper diagnosis of distinct conditions is presumed, and I am expected simply to outline treatment for those defined conditions; hence, without qualification, I repeat, that pus being present in the region of the cæcum operation is positively indicated.

Many other risks are to be taken rather than those of purulent peritonitis, for early interference will save most if not nearly all cases



from this latter dread complication, while the danger of operation becomes slight compared to that of rampant abdominal inflammation.

Local or general peritonitis supervening in a person who has a history of cæcal trouble, or starting during a first attack, would more than justify operation.

At a later or even perhaps chronic stage of the disorder, all available diagnostic skill must be exerted when a peri-cæcal abscess may have pointed in an anomalous situation, and we must ever adhere to the modern surgical rule, always to attack pus at its source if possible. When the cæcum is normally placed, this is always feasible, if the disease be recognized.

Coming now to speak of actual operative measures, the patient, as a matter of course, must be got into the best possible condition, and surgically clean by the usual methods of attempting these ends. Asepsis should rigidly prevail throughout.

The aspirating needle must never be used, for if it does not find pus we cannot be sure that none is present, whilst its own dangers are not inconsiderable. In these cases it is a poor and especially unsafe diagnostic resource.

The abdominal incision should be lateral, *not* median. For if median the peritoneal cavity would often be needlessly opened, and the cæcum and appendix cannot well be reached or dealt with through it. But if lateral it can be made of less size, circumscribed abscesses will frequently be found before the peritoneum is reached, and at its base all necessary manipulations can be made upon the cæcum, appendix, and surrounding parts without opening the peritoneal cavity, whilst should the abscess or ulcer have reached that cavity the intestines, etc., can just as well be examined and cleansed through a lateral as a median incision.

Attempts to reach the cæcum by the lateral or subperitoneal incision without opening that membrane will nearly always be found impossible to carry out, and even should the organ be so reached lesions cannot be properly dealt with at the bottom of such an opening.

The favored or lateral incision should begin at a point an inch above Poupart's ligament and to the outer side of the right linea semilunaris, be continued in a vertical direction upward about four inches, and carried down through the parietal muscles until pus, cæcum, or peritoneum encircling that organ be reached. Then the wound can be enlarged if necessary. If pus be found, wash its containing cavity clean, and get a clear view and careful examination of the cæcum and

appendix. The latter is almost always the seat of trouble, and perhaps it would be well to excise it whilst we have the chance in any case, for any cæcal trouble would be likely in time to excite disorder of its appendages. Without a doubt it should be so treated if found inflamed, perforated, or harboring a foreign body. This can best be accomplished by ligating it as close as possible to its cæcal attachment and cutting it off. Cæcal perforations, if found, should be closed by Lembert sutures, whilst ulcers, which may be present but have not perforated, should by the same means be turned into the bowel lumen. If the general peritoneal cavity has not been involved, the abscess or cæcum, or what not in view, should be gently everted, washed out with a one to one thousand bichloride of mercury solution, a large glass or rubber drain introduced, and the abdominal wound closed around it with silk sutures, and a dressing superimposed.

If the peritoneum has become involved and but a short time before the operation, the whole abdominal cavity must be most thoroughly washed out with hot ( $105^{\circ}$  to  $110^{\circ}$ ) distilled water, or one to ten thousand bichloride of mercury solution, and cleansed with sponges, and the foreign body, if that has been the source of trouble, searched for. Should peritonitis be found further advanced the intestines must be withdrawn, and all adhesions parted with the finger or knife during the process of cleansing and before they are returned to the peritoneal cavity. In the case of general peritonitis a glass drain must be carried to the bottom of the pelvis and kept in working order by means of absorbent cotton ropes acting by capillarity. If a second tube is not used for the superficial or peri-cæcal abscess cavity the drain going to the pelvis must have perforations as high in it as the level of the cæcum and any surrounding trouble.

If the inflammation should be caused by the presence of a foreign body in the cæcum itself or by impaction of feces, they must be either excised or urged by prudent force along the bowel. In their operative removal a simple incision, afterward united by Lembert sutures, would answer every purpose.

If portions of the cæcum have sloughed or become gangrenous and the breaches of continuity are too large to approximate with Lembert sutures without producing dangerous constriction of the gut, we will have to content ourselves with the formation of an artificial anus.

Post-operative treatment would consist in keeping the bowels in a fairly soluble condition, the tube clean, and in meeting threatening peritonitis by active purgation.

These same general principles of treatment will hold even for those are cases of displacement of the cæcum as into scrotal and other herniæ, its abdominal transposition, etc.; the great question in these cases will be diagnosis.

Typhoid cæcal or appendicular inflammation or perforation likewise should receive identical treatment as for the simple inflammatory disorders of that region. This whole subject is still in its infancy so far as the majority of the profession are concerned, but the child is of almost boundless promise.

I can terminate this going over the field of cæcal inflammatory disorders, their pathology, diagnosis, and treatment in no better way than by showing to you the patient whose case was reported to you by Dr. Woodbury in April last, and upon whom I operated. He has been benefited as much by the practical application of the principles of treatment which have been laid down, as any human creature ever can be.

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## DISCUSSION.

DR. W. W. KEEN said: I remember very well the first post-mortem that I made in private practice, twenty-one years ago. It was on a patient who had died of typhlitis without operative treatment, and the question arose in my mind at that time, whether or not a surgical operation might not have relieved him. This was in 1866. In 1867, Willard Parker, of New York, practically systematized the operation. Since then, the sense of the profession in general has been more and more toward the operative treatment of these desperate cases.

I should like to say a word or two with reference to the diagnosis. I have seen many of these cases, and I have yet to see one in which a distinct tumor was present. As a rule, tumefaction will be found, but no tumor. Nor is any fluctuation found in these cases. In a case which I saw in consultation eight years ago, there had been extensive infiltration in the right iliac fossa, for three weeks; but there was absolutely no tumor and no fluctuation; yet, when the cavity was opened, a pint of pus was found. We should make up our minds positively, in reference to the surgical treatment of these cases, that we are not to wait for the formation of a distinct tumor or the presence of distinct fluctuation.

Another symptom, to which Dr. Pepper alluded, I have not found a constant one—and it is surprising that it is not—that is, the flexing of the right thigh. Not only may this be so, but all the other symptoms may be fading, and yet pus be present. In the *Medical and Surgical Reporter* for the early part of 1886, I reported a case in which I operated on the sixth day. The symptoms had followed the ingestion of a large quantity of grapes, the temperature reaching 102.8°. The fever and pain had nearly disappeared, and the other



symptoms had ameliorated to such an extent that convalescence seemed almost established. Here the diagnosis and treatment hinged upon one measure, which I was rather surprised to hear Dr. Morton condemn—that is the use of the aspirator. He, however, did not speak of the hypodermic syringe, and I do not know whether or not he includes that in his condemnation. In these, and certain other cases, I think that the use of the syringe for exploratory purposes is strongly to be commended. I grant that it is not always safe to use the smallest of the needles of the aspirator; but to the use of the hypodermic syringe I see no objection whatever. If it penetrates any normal structure, it will do no harm; and if it reaches pus, it gives a positive indication for operation.

The time at which pus forms is often extremely early. I have had two cases in which on the sixth day a large quantity of pus was found. Both of these cases made excellent recoveries. In the case seen with Dr. Pepper, pus was found as early as the close of the third day.

I was glad to hear Dr. Pepper refer so strongly to the importance of the rectal examination in these cases. Others have alluded to this, but the urgent importance of it has never before been seriously dwelt upon. Dr. Musser has shown that the appendix often lies directly on the brim of the pelvis. If the perforation be near the cæcum, the pus will find its easiest outlet, in not a few cases, toward the cavity of the pelvis. It is, therefore, in the majority of cases, within easy reach of the finger; and, in an urgent case, if it cannot be reached by the finger, the introduction of the hand, provided it be a reasonably small one, may be practised.

Both Dr. Pepper and Dr. Morton have alluded to operation in these cases. As is well known, the operation of Dr. Willard Parker consists of an incision not vertical, but parallel, to Poupart's ligament. This incision will do very well in the majority of cases, where the lesion is situated in the right iliac fossa proper. Either this or the vertical incision to which Dr. Morton alluded, may be selected. As we go further and do not find pus, the hypodermic syringe may be used for purposes of further exploration. In the second class of cases alluded to by Dr. Pepper, where there is perforation of the appendix, where there is absence of induration in the right iliac fossa and especially if there is general peritonitis, I should certainly favor median, and not lateral laparotomy. The latter does not give so simple and bloodless an operation; nor does it give us so easy access to the cavity of the pelvis for exploration, for drainage, and for the surgical manipulations that may be necessary. In the case I operated on one year ago, for Dr. Pepper, I regret that I did not do a median operation at once, instead of doing the lateral operation. The median operation will give us every facility for operation on the viscera in the right iliac fossa, and especially will it give us access to the appendix. Unless the indications for lateral operation be strong, I should favor the median incision.

I should hesitate to perform puncture of the rectum. It would be far better to do a laparotomy, rather than in the dark, not knowing what the lesion was, simply to drain the cavity of the pelvis, as we would do by rectal puncture. We want to know what condition exists; we want to find out the exact facts. Exploratory operation is not only constantly done, but done, I may almost say, without any additional risk to the patient, and it gives us

the means of dealing with whatever lesion we may find. If the appendix is perforated, we should ligate it and remove the diseased portion. If the cæcum should prove to be the seat of perforation, we should close the opening with the Lembert suture. If the perforation is too large for this, it will be necessary to follow the plan suggested by Dr. Morton, and make an artificial anus.

DR. W. HUNT said: The suggestion has been made that treatment with salines should take the place of the opium treatment in these cases, especially after operation. This is a point on which more experience is needed before we can reach a decision. When we take into consideration the fact that several cases of perforation of the appendix have been known to get well under the opium treatment, as proved by post-mortems long after, and also the fact that the mortality after the adoption of that treatment years ago, fell to a large extent, we should not hastily abandon it. It is no wonder I feel kindly toward it, for I am told that I am indebted to the opium treatment for my recovery from an analogous lesion—*i. e.*, perforation of a typhoid fever ulcer.

A word with reference to the operation of ligating and cutting off the appendix. It seems to me that by this method it might possibly be found that only mucous surfaces had been brought into contact and adhesion not secured. It would be better after removing the diseased portion to close the stump by the Lembert suture.

DR. WM. OSLER said: I should like to make one or two remarks bearing upon the anatomy of this region. There can be little or no doubt that the cæcum—namely, that portion of the large intestine below the orifice of the ileum—is, in ninety-five per cent. of all cases, absolutely free. In the one hundred cases analyzed by Treves, there was not one meso-cæcum. If he had examined five or six hundred cases, he might have found two or three. I have the records of many instances in which the cæcum occupied the classical position and was surrounded by peritoneum only on the front and sides; and last week in two cases in succession a well-developed meso-cæcum was present.

It is remarkable how large a number of cases of appendix disease recover. I have carefully gone over my notes, and I find six cases of obliteration of the appendix. These had been peri-cæcal inflammation with subsequent obliteration. I find a record of eleven cases of ulceration, seven in phthisis and four in typhoid fever. I have never met with foreign bodies in the appendix, but I have on two occasions had foreign bodies brought to me that had been found in subjects in the dissecting-room.

The important point in connection with perforative appendicitis, is that in the majority of cases the perforation occurs first with slight inflammation in the neighborhood, perhaps lasting a few weeks or months, without exciting any special symptoms; and the first symptoms to which the attention of the physician is called, and which are rapidly followed by peritonitis, are those of perforation not of the appendix, but of the appendiceal abscess. In five instances of peri-cæcal abscess which I have examined, in every one of them there was evidence that the abscess had lasted some time. That this is the case is evident from the fact that there are many instances—of which I have had three—in which there was no perforation into the peritoneum,

and no peritonitis occurred, yet there were signs of septic fever. The perforation had led not to general peritonitis, but to inflammation of the portal branches and diffuse abscess of the liver. This is a point which, I think, has not been sufficiently recognized in dealing with these cases of perforation of the appendix.

With regard to cæcal disease, we have all seen the cases which have been described by Dr. Pepper. I think that they result, in the majority of instances, from impaction; and that the induration which we feel is in most cases fecal, is, I think, evident. As Dr. Pepper has said, it is important to distinguish between these cases and appendicitis, for the majority recover. We, however, learn from post-mortem examinations that a considerable number of cases of perforation of the appendix also get well—cases, too, in which there have been no special symptoms.

I have had three cases of peri-cæcal abscess from disease of the cæcum. Two were cases of round ulcer of the cæcum. In both the cæcum was the only part involved, the ulcer not being larger than a quarter of a dollar. In both instances the perforation was posterior and had excited suppuration in the tissues as high as the kidney. In one instance the abscess had been opened in the loin and had discharged very freely. In the third case the perforation was due to cancerous ulceration. There was in this case a large perforation just beyond the orifice of the ileum.

DR. J. C WILSON said: I should like to indicate a division of the subject which I have not thus far heard mentioned. Dr. Pepper has alluded to the form of inflammation which is so common, and which is probably due to fecal impaction. A large proportion of these cases recover, and the anatomical condition present must remain, to a large extent, in doubt. I am disposed to regard it as a local enteritis involving the cæcum, and, perhaps, the appendix. I believe the fulness that is present is due in part to fecal impaction, and in part to plastic exudation around the bowel.

In the second place, we have those cases in which there is the formation of peri-cæcal abscess, more or less limited in extent, and in course of time this will require surgical interference.

The third group of cases is that in which there is more or less extensive and general peritonitis, and this peritonitis may be due, as Dr. Osler has pointed out, either to rupture of a peri-cæcal abscess or to primary rupture of the appendix, with the escape of its contents into the peritoneal cavity. I believe that in this form we have to deal with two essentially different processes. In the first place, we have those cases in which peritonitis rapidly develops as the result of the escape of the contents of the appendix, or of a peri-cæcal abscess, and these cases demand the surgical interference which has been indicated to-night. I believe that there is another class of these cases in which the peritoneal process results, not in purulent exudation finding its way down into the pelvis, but in plastic exudation from the beginning. Here we have the typical symptoms of general peritonitis without the formation of pus. These cases, I am led to believe from my own experience, not only terminate in recovery, but do better without than with surgical interference.

DR. J. S. NEFF said: The early period at which pus formation takes place in these cases has been referred to. I would only mention a case which illus-



trates the rapidity with which general peritonitis may appear. I made a post-mortem on a child which was struck with a stone, causing rupture of the bowel. Death occurred seven or eight hours after the accident, not from shock, but from general peritoneal inflammation.

DR. E. MONTGOMERY said: I have met with a number of cases of these affections. It is certainly difficult to decide what should be our plan of treatment. We have cases in which this trouble exists, and goes on to local peritonitis, and under proper treatment recovery occurs. We have other apparently similar cases, which end fatally under the same treatment. Three cases have come under my observation. One was a man some twenty years of age, who complained of severe pain in the right iliac inguinal region, with considerable tympanites, and with symptoms of peritonitis. Leeches, followed by hot poultices, were applied, and morphia administered hypodermically. By the seventh day the acute symptoms began to subside. On the morning of the eighth day he had a severe lancinating pain in the side, with collapse, followed by death a few hours subsequently. The post-mortem revealed gangrene of the end of the appendix. This had been circumscribed by plastic exudation. At the time that the lancinating pain had occurred, an artery had been opened, and hemorrhage had occurred, which broke through the exudation, and a pint of blood was found in the peritoneal cavity.

The second case I saw in consultation thirty-six hours before the death of the patient, who was a man fifty years of age. There were marked signs of peritonitis, with great distention of the abdomen, greatly interfering with the breathing. It was not deemed advisable to operate. As there were constant efforts at vomiting, I introduced the stomach tube. This was followed by the regurgitation of half a pint of black material. This gave considerable relief from the distress, and the abdomen was much reduced in size. On examination, perforation of the appendix was found.

The third case was one of those reported to-night, in which operation was performed.

I have now under treatment a patient seventeen years of age, who, during the last six months, has had eight or ten attacks of tenderness in the right inguinal region. Although he has been in bed for the past three weeks on a restricted diet, he is now suffering from another recurrence of the symptoms. It is a question whether or not in this case it would not be better to do a laparotomy for the purpose of removing the appendix when the inflammation subsides.

DR. E. T. BRUEN said: The treatment of peritoneal inflammation by salines is receiving considerable attention at the present time. From what has been said to-night, it would seem clear that in the treatment of typhlitis the important measures are those which secure rest, including the use of opium and the avoidance of all violence; and when the inflammation has subsided, the removal of the impaction by such mild laxatives as calomel; and, besides this, the treatment of the catarrhal condition by appropriate measures.

In those cases where there has been rupture of the appendix, with the occurrence of peritonitis, it seems improbable that the administration of repeated doses of salines would be likely to do much good. I think that the

expression of medical opinion as to the measures to be employed under these circumstances should be clear.

DR. J. H. PACKARD said: I would briefly refer to one or two of a number of cases illustrating the subject of this evening's discussion, which have fallen under my observation.

The first occurred in the practice of the late Dr. J. F. Meigs, in 1860, and is reported in detail in the *American Journal of the American Sciences* for 1861. At the autopsy, made by me, it was found that an intestinal concretion had lodged in the appendix vermiformis, and had caused a circular band of ulceration, at one point of which perforation had taken place. There was a collection of pus about the appendix, and universal suppurative peritonitis, with flakes of lymph on the coils of intestine.

Another case, which occurred in 1879, in my wards at the Episcopal Hospital, may illustrate the difficulty of diagnosis sometimes met with in these cases before the recent advances in the surgery of this region had been made. A boy, about seventeen years of age, who had worked on a farm, was admitted on account of lameness, ascribed by him to ulceration of his right heel by a heavy and ill-fitting shoe. There was a swelling in the upper part of the thigh, which was regarded as a sympathetic bubo. At the lower part of the abdomen there was also some fulness and tenderness, which should have attracted more attention than it did, and which ought to have suggested the true nature of the case. Several openings occurred below Poupart's ligament; the discharge was very abundant, and soon became fecal in character. A little later, fluctuation was noted above the ligament. Parker's operation was performed, and a small angular piece of beef-bone was found that had worked its way out of the bowel. A more radical procedure, such as would now be resorted to, might have saved the life of this patient, who died exhausted.

As to the employment of the hypodermic syringe for diagnostic purposes, it seems to me that if fluctuation is clear enough to warrant this, its aid is scarcely needed. It must not be forgotten that there are on record several cases in which fatal fecal extravasation has followed the puncture by this means of a herniated bowel.

With regard to the choice between the lateral and median incisions, I think that where the trouble is clearly in the right side of the abdomen, this is the proper surgical entrance. If there is no necessity for opening the peritoneum, it is certainly sufficient. And if there is such necessity, a lateral incision eight inches in length, such as is recommended for other purposes by several surgical writers, will give abundant access.

I would suggest that in women a vaginal examination may enable us to explore the iliac regions as well as the ovaries and tubes.

DR. W. W. KEEN said: I do not wish to be understood as advocating indiscriminate laparotomy in cases of peri-cæcal inflammation. I attempted to draw a distinction between those cases in which the pus is evidently in the iliac fossa, where the lateral incision is the proper one, and those cases in which examination by the rectum, and the vagina in women, shows that the pus has not been limited to the iliac fossa, but is in the cavity of the pelvis, where a median laparotomy is the better operation.

DR. C. WIRGMAN said: I rise merely to emphasize one symptom mentioned

by Dr. Pepper, and that is, the extension of the pain into the genitals. I had one case in which the pain radiated down the inner and outer aspects of the right thigh. In that case, which terminated fatally, the autopsy showed a concretion, but no foreign body. I had cautioned the utmost quiet. The patient was, however, a restless child, and on the eighth day flung himself from one side of the bed to the other. This was at once followed by excruciating pain, for which it was necessary to administer ether.

DR. MUSSER said: I have but a word to say in conclusion. I do not deny that typhlitis occurs, I wished simply to emphasize the relative importance of appendicitis as compared with typhlitis. Typhlitis may occur just as inflammation in other parts of the colon may.

I am glad that Dr. Osler referred to the relations of the peri-cæcal abscess to the peritoneum. In my hurried remarks, I neglected to mention it. It must be borne in mind that the danger of a peri-cæcal abscess depends entirely upon its relation to the peritoneum. When intimately connected with it, or rupturing into the peritoneal cavity, the danger becomes imminent.



## THE TECHNIQUE OF OÖPHORECTOMY.

BY CHARLES MEIGS WILSON, M.D.

[Read December 28, 1887.]

ALTHOUGH so much has been written on the subject of oöphorectomy that it seems hardly possible to add anything new to our present knowledge on the subject, yet success depends so much on the manner and the details of operating, that it is not perhaps a waste of time to call attention to those methods which have received the stamp of approval of the surgeons who have thus far had the best results in abdominal surgery. The methods detailed below are the *common* property of the medical profession, evolved by the experience of many operators. Some the author first saw used in England and in Germany, others are the result of American ingenuity, and all are of great importance in the production of good results after operating. If to any one man belongs a larger share of credit than to the rest in popularizing these methods in this section of the country, certainly Dr. Howard A. Kelly, of Philadelphia, deserves it.

*Preparation of the patient.*—Let us first consider the preparation of the patient. In all cases, it is advisable for the operator to have his patient under observation some little time before the operation. This has the double advantage of giving the operator and the patient time to become acquainted with each other, and for the patient to acquire confidence in the operator, and gives the surgeon opportunity to study carefully the case. Too much condemnation cannot be given to hasty and ill-considered operations. The urine should be carefully examined, in order to see that it is free from albumen. Neglect of this rule has doubtless oftentimes been the cause of the patient's death. The gastro-intestinal canal should be in state of healthy function, and the day preceding the operation all portions of the intestine should be thoroughly emptied. This is best secured by the administration of some gentle laxative, such as the compound liquorice powder, in one or two drachm doses; or, if there be some torpidity of the liver, by

the administration of one-twelfth of a grain of calomel every hour until the bowels are opened; care, however, being taken in both cases not to purge the patient, and not to set up excessive peristalsis. On the morning of the operation, the rectum should be emptied by an enema, and in order to prevent the accumulation of gas in the intestines, and to avoid gaseous distention of the intestines, it is generally best to put into the laxative enema administered a little turpentine emulsified with the white of an egg. This, as rule, relieves the intestines of any accumulation of gas present in them, and at the same time is not irritating.

The patient should have, on the morning of the operation, a hot bath, which will add to her comfort and remove any sebaceous matter on her abdomen; it is best to have the patient sponged with alcohol after the bath. Also, on the morning of the operation, the patient should abstain from taking any food, unless it be a cup of strong coffee or a little milk and lime-water. The administration of this food should always precede the time of operation by three or four hours. Above all, it is necessary that the patient have a chance to recuperate her strength and prepare for the mental and physical ordeal of the operation by having a rest in bed of at least three days before the operation, and this is especially important if the patient has come on a long journey and is fatigued with travelling.

*The surroundings of the patient.*—By election, it is always best to operate upon the patient in a hospital, particularly if one have a hospital ward especially devoted to this class of work, in preference to operating upon the patient at her own home. The reasons for this are obvious. In the hospital there are trained assistants and trained nurses, and if the operator be busy with this kind of work, the nurses have no other cases to manage and are especially trained and especially adapted to this work. Again, too, in the hospital the operator always has his own assistants, who are accustomed to his methods, who understand his wants and who know exactly what to do at the right moment. In a hospital the operator, as a rule, has an assistant whose especial duty it is to administer the anæsthetic and where there is an anæsthetizer properly trained for his work and competent, the operator's mind is entirely relieved of the responsibility of the administration of the anæsthetic. He does not have to look at the patient to see how she is doing under the influence of the anæsthetic; he does not have to be interrupted in his work by the patient getting too much ether or chloroform, nor is he bothered with rigidity and stiffening of

the abdominal parietes because the patient is not sufficiently under the influence of the anæsthetic.

At the patient's home, especially if it be far distant from the home of the operator, it is not always possible to have either good nurses or good assistants, and the lack of these contributes largely to the difference in the mortality rate in operations done at the patient's home and those done in hospitals especially adapted to this work. Again, in the hospital the operator has time to investigate thoroughly the patient's case, and to weigh all the points pro and con, whereas at the patient's home he is often obliged to operate hastily, and with a diagnosis formed after a hasty inspection of the patient and study of her case which is oftentimes not confirmatory of the diagnosis of the regular medical attendant. Prior to the operation, it is better that the patient should have a room remote from the operating-room with all its appalling armamentarium and paraphernalia, in order that she may not become frightened or worried by seeing the preparations for the operation. It is best on the morning of the operation to bring the patient to a room adjacent to the operating-room, where she may rest until the anæsthetic is administered. The room should be bright, cheerful, airy, and spacious, and should have pictures on the walls, or something in the room to divert the patient's attention. The patient should also be constantly attended by a nurse during the hours preceding the operation, in order that she may not become lonely and allow her mind to dwell upon the operation. It is best, both before and after the operation, to exclude rigorously the friends and relatives from access to the patient, and to have the patient give herself up entirely to the operator, in order that he may control her movements without the interference of relatives and friends.

*The operation.*—The room for the operation should, when possible, have walls and floors which can be thoroughly cleaned and disinfected, in order that the operation may be conducted in an aseptic atmosphere. For this purpose, the operator's own operating-room has tile floors and glazed tile walls, so that the whole place can be flooded out with water, and placed in a thoroughly clean condition. An operating-table of plain wood, painted, resembling in size and shape the ordinary kitchen table, is all that is really necessary. One or two stands of light construction, and upon large castors, in order that they may be readily wheeled from one portion of the room to another, and a chair for the assistant who holds the patient's limbs, are all the furniture required. A large can containing distilled water and an alcohol lamp or gas burner under it so as to maintain the heat of the



water at a fixed temperature, and a tube running from the can to the table, so that at any time during the operation the whole operative field can be flooded, is also in the room. The sponges are used over and over again until the sponge fibre commences to show evidences of disintegration. These are always of the finest quality and for the most part those which are known as potter's sponges, or thin, flat sponges. For the first time, they are prepared as follows:

All of the dust is first beaten out of them. They are then immersed in a fifteen per cent. solution of hydrochloric acid for forty-eight hours. They are next thoroughly washed until all the acid is removed from their interstices. Then they are placed for half an hour in a solution of permanganate of potassium, 180 grains to five pints of water. This is done in order to bleach them. The hydrochloric acid solution is, of course, for the purpose of removing any mineral matter that may be in their meshes. They are again washed in running water and placed in a solution consisting of ten ounces of the hyposulphite of sodium, five ounces of hydrochloric acid, and sixty-eight ounces of water. They are allowed to remain in this solution for a period of from two to four hours until thoroughly bleached. They are next thrown into troughs of running water where they are allowed to remain for several hours. Afterward they are placed in jars containing solution of bichloride of mercury (1:1000) and hermetically sealed until the time of operation. After an operation they are washed out in warm water, then soaked in a solution of sodium carbonate half ounce to a pint of water for three or four hours, then rewashed in warm water and put back in the 1:1000 bichloride solution ready for use again. The instruments are all nickel-plated, with the exception of the cutting edges. They are prepared by being first scrubbed with glycerine soap and then immersed for several minutes in boiling hot water. They are then laid upon towels which have previously been immersed in the solution of the bichloride of mercury (1:1000) and thoroughly dried by superheated steam. They are then ready for use. The needles are kept in a five per cent. solution of carbolized oil. The ligatures and sutures are kept immersed in a solution of bichloride of mercury (1:500). They are always washed in distilled water immediately before being used. For suturing the abdominal wall silkworm-gut has been found most satisfactory, clamped and held in position by perforated shot. For ligatures the twisted Chinese silk, imported by Mr. Snowden of No. 7 South Eleventh St., Philadelphia, has been found to be the best. For anaesthesia, chloroform has been used instead of ether, unless the

operation is likely to prove a long one. The reason that chloroform is preferred to ether is the author's belief that chloroform when properly and carefully administered is nearly as safe as ether, and because with chloroform, as a rule, there is none of the bronchorrhœa and gastric disturbance which usually follow the administration of ether. Where ether is given, it is found that a less amount is required and that the anæsthesia is more satisfactorily induced and maintained by administering the ether upon the Allis inhaler rather than with the ordinary cone. Where chloroform is employed, it is usually administered by means of the shield devised by Professor Billroth and used in his clinic.

The temperature of the operating-room should be about 75°. It is best to cover all portions of the patient's body with light blankets, with the exception of that portion of the abdomen involved in the seat of operation. An assistant sits at the foot of the operating-table, and receives and holds the patient's limbs, passes the catheter just before the operation, and, when necessary, with the finger in the vagina, lifts ovary, tube, or pedicle up into the abdominal wound, as the operator may desire. A trusted assistant takes charge of the anæsthetic, and does nothing else. The chief assistant stands on the left side of the patient, ready to give immediate aid to the operator.

Immediately preceding the operation, the patient's abdomen is wiped off with a little ether, in order to remove any greasy matter that may be present upon the abdominal wall, and it is then washed with the bichloride solution (1:1000), and carefully dried, especial care being taken to see that all the little folds about the umbilicus are perfectly clean. If there be an abundance of suprapubic hair, sufficient is removed to give a chance for extending the incision downward if necessary. The operator having satisfied himself that the patient is sufficiently anæsthetized—and by sufficient is meant that she is anæsthetized to the surgical degree—the abdomen is opened with a few rapid strokes of the knife, without the use of the director.

The operator can readily judge of the depth of the abdominal wall, and really no care is required until the subperitoneal fat is reached. The abdomen is opened in the median line, care being taken to strike the linea alba if possible, so as not to open the sheath of the recti muscles. If we fail to strike the linea alba, no time is lost in dissection in order to reach it; but if we miss it, the abdomen is opened if need be, through the rectus muscle. The rule with reference to the incision best to be followed is to make it as small as is compatible with the removal of the ovary or of the growth. Where oöphorectomy is

performed, an incision one and one-half or two inches in length is amply sufficient. On the contrary, where an ovarian cystoma is to be removed, and the tumor is a large one, or, perchance, semi-solid, or where the adhesions are numerous, it is a great deal better to enlarge the incision in order that the growth can be readily gotten at, rather than to attempt its removal without knowing exactly what we are doing, and without having room enough to raise it up through the abdominal wound. No care is taken to prevent the blood from the wound in the abdominal wall escaping into the peritoneal cavity, and although it is always best to avoid allowing the contents of a cyst getting into the abdominal cavity, it is thought best to complete the operation rapidly, rather than to avoid the escape of the cyst contents into the abdominal cavity. If, however, we are dealing with a pus tube then, of course, the greatest care must be used to avoid the escape of the pus into the peritoneal cavity, owing to rupture of the tube wall. The pedicle is transfixed with an aneurism needle, the penetrating arm of which is at right angles to the handle, and tied with stout, twisted Chinese silk. The loop of the ligature carried through the pedicle is held as the needle is withdrawn, and divided; each half of the pedicle is tied, and then the whole pedicle is tied with the remaining parts of one of the ligatures. The pedicle is severed close to the ligature, care being taken, however, to leave sufficient of the pedicle to prevent the ligature from slipping. An important precaution to take to avoid secondary hemorrhage, is to hold the pedicle with the Martin forceps for a few moments and then, if there be no evidence of hemorrhage, it is dropped back into the peritoneal cavity. Where there is any tendency to hemorrhage from the pedicle, it is lightly touched with the flat button of the Paquelin cautery. Where the ovary is bound down by adhesions, and there is oozing from those which have been torn asunder, they are lightly touched with the finger, which has been rubbed against a piece of the perchloride of iron. The abdominal cavity is then invariably flooded for about five minutes with a stream of distilled water at a temperature of 100° F. It is surprising to see how, when a patient is profoundly shocked, this intra-peritoneal irrigation with hot water will immediately restore the equilibrium of the pulse and rally the patient from the shock. In operating, care should always be taken not to handle the ovary or the meso-salpinx any more than is absolutely necessary, because, as has been frequently noted, the patient's respiration becomes embarrassed, and oftentimes temporarily ceases during the time that the ovary is in the grasp of the operator's fingers. Where there is a cyst of any size,



is contents are aspirated with Mears's trocar; but where the cyst is small, we prefer to enlarge the abdominal wound, rather than to delay the operation by evacuating the contents of the cyst with the aspirator.

*The toilet of the peritoneum.*—First, as noted above, the peritoneal cavity is thoroughly irrigated with distilled water at a temperature of 100° F. The patient is then turned on her side and all the water allowed to drain out that will. She is then again turned upon the back and the peritoneal cavity carefully sponged, the intestines and mesentery being held out of the way with one hand while with the other the operator carries the sponge attached to a bayoneted sponge-holder, first into the retro-vaginal portion of the peritoneal cavity and then into both iliac fossa. The sponging is continued until all shreds of coagulated blood are removed and until when the sponge is brought up only a pale pinkish fluid escapes when it is squeezed.

When we are sure that all hemorrhage has ceased within the peritoneal cavity, the intestines, if any have been left out of the abdominal cavity, are carefully replaced and the mesentery is folded over them. If necessary to lift loops of intestine out of the abdominal cavity, they should be carefully wrapped in soft towels kept moist and at a temperature of 100° F. Upon the mesentery is placed a thin, flat potter's sponge which extends half an inch or more around all portions of the wound. This is placed there in order to absorb any blood which may escape from the needle punctures. Its centre is grasped by a hæmostatic forcep in order to facilitate its removal after the sutures have all been introduced. A strong, stout needle threaded with a loop of cat-gut or Chinese silk, in order to snare the silkworm-gut, is used in the introduction of the sutures. The sutures are all introduced from within outward in order to avoid wounding the intestines with the point of the needle, and the free ends of each suture are held in the bight of the hæmostatic forceps. When the sutures are all introduced, the flat sponge is removed and the central suture is first tightened. It is found that, as a rule, this makes a neater approximation of the edges of the wound. The sutures are fastened with perforated shot. The abdomen is carefully washed with the solution of the bichloride of mercury (1 : 1000), immediately the wound is closed. There is then poured over the surface of the wound a liberal quantity of Keith's dressing (twelve per cent. solution of carbolic acid in glycerine). Over this are laid five or six thicknesses of Lister's gauze and over the first thickness of the Lister's gauze (the one nearest the wound surface) is dusted a liberal quantity of pulverized iodoform or equal portions of iodoform and boracic acid. Over the Lister's gauze is then placed a

thick wad of bichloride wool—that is, wool that has been wet with a solution of bichloride of mercury (1 : 1000) and thoroughly dried. Over this dressing is applied a bandage of opera flannel fastened with safety pins.

*After-treatment.*—For the first twelve hours after operation, the patient eats absolutely nothing. If, at the end of that time, the patient has rallied from her shock, and there is no hyperpyrexia or other symptoms of evil import, we commence to feed her with weak tea, ice-cold, giving two or three drachms every hour. This we have found by experience to be the best way of quenching thirst and furnishing gentle stimulation without overtaxing the stomach or producing nausea or emesis. At the end of twenty-four hours we commence the administration of food. This is preferably milk if the patient will take it and the stomach retain it. If the stomach be irritable, we give Koumiss or Matzoon in place of milk. Unless the stomach rebel, the use of the milk is continued in half-ounce doses with a little lime water, and after a few hours it is alternated with beef or chicken tea; on the fourth day, if the patient is doing well we commence the administration of animal broths and soft food.

The dressing is never changed unless symptoms arise leading us to suppose there is something wrong with the wound, or trouble within the peritoneal cavity. The sutures are removed on the seventh or eighth day. Drainage is never employed, unless we have reason to fear tissue necrosis as the result of traumatism of the operation, or unless we fear hemorrhage into the peritoneal cavity. If symptoms arise which indicate drainage, it is a very easy thing to open the lower angle of the wound, and insert a drainage tube; where a drainage tube is used, glass is the preferable form. Great care must be taken to see that the mouth of the tube is thoroughly closed by a little tuft of the bichloride wool. When it is necessary to remove any fluid contained in the drainage tube, it is best done with the long uterine syringe, and after the removal of any fluid it is well to pour along the sides of the drainage tube a few drops of Keith's solution of carbolic acid and glycerine. As a rule, the patient is kept in the hospital for a week after the sutures are removed, and is enjoined from travelling any distance until a month has elapsed from the date of the operation. The bowels are moved, as a rule, upon the sixth day, preferably by a gentle saline. Recently we have found Rubinant water the best for this purpose, giving a third of a tumblerful as a dose.

Great care should be taken by the operator to know exactly how many hæmostatic forceps, instruments, and sponges are present in the

room prior to the operation. It is the duty of the nurse to count over the instruments and have the count verified by an assistant both before and after the operation in order that the operator may avoid the distressing accident which has happened now many times of leaving a hæmostatic forceps or sponge within the abdominal cavity.

The operation may be performed at any time, with the exception of the menstrual period, and five days before and five days after it.

*Complications arising in the after-treatment.*—A majority of the cases that die after oöphorectomy perish from sepsis. Where proper care is taken in the preparation and management of the operation to have everything about the patient, including the atmosphere of the operating-room, the patient's body and clothing, the instruments, the dressings, and, above all, the conduct of the operation in aseptic condition experience has shown that an extremely small per cent. of patients die from this cause. Careful attention to the rules described in this paper will do a great deal to prevent trouble of a septic nature after the operation. Cleanliness is the desideratum, and this is not by any means attained by the use of antiseptic agents. Indeed, the best results have been obtained, not with the use of carbolic acid or corrosive sublimate, but by the use of distilled or plain boiled water. Personally, I take it that the use of carbolic acid is never justifiable, for it can never be used in solutions sufficiently strong to possess aseptic properties without subjecting the patient to the danger of carbolic acid poisoning. Where, however, septicæmia does present itself it is best combated by reopening the abdominal wound and irrigating the peritoneal cavity with hot water. The septic hyperpyrexia is best reduced by the administration of antipyrin, and when once the temperature is gotten within the safety line it is best kept there by the administration of quinia. In desperate cases good results in the reduction of high temperature may be hoped for from the ice cap. Stimulus must be freely given, and opium or chloral in sufficient doses to control the nervous disturbance which is nearly always present. Where it is necessary to give opium or chloral, it is best to give it by the rectum, saving the stomach for the administration of food and stimulus.

Peritonitis following the operation is, I believe, generally septic in character; it is best subjugated by the use of salines. Shock after the operation requires the same plan of treatment employed in treating shock after any other operation. The usual means employed—external warmth, and the hypodermic administration of cardiac stimulants, as soon as the patient can swallow a few spoonfuls of hot coffee—will generally be found the best means to counteract the shock.



*The limitations of the operation.*—As this subject was the one which I had purposed bringing before the attention of the Society for discussion to-night, permit me to give you the conclusions I have come to in the matter. I believe the operation is justifiable for the relief of ovarian pain, otherwise uncontrollable; for the artificial establishment of the menopause in cases of uterine fibroma characterized by rapidity of growth and exhaustive hemorrhage and in which all other means have been tried unsuccessfully; for the cure of those cases of hysterо-epilepsy which have well-defined menstrual exacerbations and which have failed to yield to all other plans of treatment; and finally for those cases (which abound in every hospital for the insane) in which the mania or mental aberration is evidently dependent upon, or caused by, the act of ovulation. Indiscriminate, or what may be called hit or miss spaying, cannot receive too severe condemnation, and I doubt not that the same obloquy and censure will overtake in the future the enthusiastic surgeons who resort to this procedure upon the slightest pretext as overtook in the past those gentlemen who undertook to cure all the ills of suffering womankind by following the example of Baker Brown in performing clitoridectomy.

Many of the methods herein described are already adopted by the mass of operators, but not a few of them are due to the ingenuity of Dr. Kelly, as I have before stated. The method of preparing the sponges originated, or at least was adopted, in the Pennsylvania Hospital some three years ago, and was brought to the attention of the profession in an article written by Dr. Thomas G. Morton, and published in the Philadelphia *Medical Times* of November 13, 1886. Also the general subject of the technique of oöphorectomy has lately been well described by Dr. J. Craig Smith, in his work on *Abdominal Surgery*, published by Blakiston in 1887, and likewise also in Hegar's *Hand-book of General Operative Gynecology*, translated by Grandin, and published by William Wood & Co.

[For discussion, see discussion of the next paper.]

# REMOVAL OF THE UTERINE APPENDAGES FOR DISEASE IN WHICH PAIN IS A PROMINENT SYMPTOM.

By HOWARD A. KELLY, M.D.

[Read December 28, 1887.]

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ACCORDING to the request of the Directors, that I should prepare a paper briefly discussing the operation for removal of the ovaries and Fallopian tubes in those cases in which pain is a prominent factor, and accepted as one of the indications, I have thus, although under great pressure from other work, gladly conformed to their wish, and here bring before my co-workers in other fields some of the fruits of my labors and thought in this unsettled territory of ovarian disease.

In the brief time allowed I cannot read referenees and quotations, and will speak rather from my personal experience and of the results in cases, some of which have been traced for several years, and now may be referred to as permanently cured or improved. Only by *permaneney* can any proper estimate be placed upon the value of reported results, and while successful cases are being reported in large numbers daily, within a few days or weeks of the operation, but little has been said of the condition in which the patients found themselves after one, two, and three years.

My opinion relative to the class of cases suitable for operation, to the results to be expected from operation, and as to the operation upon neurotic cases pure and simple, conforms closely to that expressed by Professor Hegar in his monograph, *Der Zusammenhang der Geschlechtskrankheiten mit Nervösen Leiden und die Castration bei Neurosen*

Nearly as I agree with Professor Hegar, I differ very widely from many other "authorities," so called, in this much-contested field. Still more widely do I differ from many views which have gained currency in the profession at large, as to the indications for and against operation, the certainty and the permanency and the value of the results obtained.

The convenience of assuming the symptom *pain* as a characteristic factor of the group of heterogeneous cases we are about to consider is at once evident. With this symptom patients usually apply and ask for nothing than that their *pain* be relieved, and under present modes of treatment and indifferent specialization in medicine, in cases even of marked disease of a minor character, the patient often goes through a protracted course of treatment in which nothing is distinct outside of the subjective elements of the case.

*Pain* alone drives most patients to consent to adopt whatever means the surgeon may propose as remedial. By thus emphasizing this subjective feature, and also by the natural history of the diseases, we exclude all those cases from our study in which *size* is a characteristic.

We have left then a great group of mixed pelvic diseases lesser in size but not in the elements of danger, causing more suffering, with greater certainty undermining the health, and in no sense less important than the large fibroid, dermoid, or ovarian cystoma, unless we measure disease by the tape measure.

"What the eye sees not the heart grieves not," is true of those who find it so difficult to realize the great hourly danger in which their patients may be living, in whom nothing may be apparent to the eye, and but little to an unpractised touch.

Common among the diseases referred to are :

Ovaries enlarged by cirrhosis.

Ovaries with extensive follicular degeneration.

Hemorrhagic ovaries.

Ovaries containing pus sacs.

Neuralgic ovaries.

Ovaries involved in a withering of the pelvic peritoneum with the tubes.

Tubo-ovarian disease with coexisting hydro-, pyo-, or hæmato-salpinx, these three names, however, signifying not the disease itself but an accident of the disease, which may be absent and the disease still exist.

Pyo-salpinx is a misnomer, as the disease may exist in all its essentials, and the tube contain no pus, but the ovary may be converted into a large pus sac. In my experience, abscess of the ovary with a tube much thickened, gelatinous and friable on section, but containing no pus, is quite as frequent as a large tube sealed and distended with pus attached to a small ovary simply enveloped in inflammatory products. I believe that the entrance of the septic material into the ovary takes place through a ruptured follicle. In a case upon which I operated one year ago, my patient married a man suffering from



gonorrhœa, she experienced no difficulty until the time of her first menstruation when she was seized with violent pains and remained an invalid ever after until I removed the mass.

*Hydro-salpinx* is more commonly associated with some mild non-septic pelvic inflammation which has resulted in sealing the fimbria and hydro-salpinx results. It may, by distention of the tube, cause pain, but the morbid process usually long antedates the formation of any tumor. If this were not the case, the rational procedure would unquestionably be slitting open the tube on its dorsum, careful removal of the fluid, and an attempt to establish a pervious uterine opening by passing a small canula into the uterus, which could be removed later per vaginam. The disease, however, lies back of this, and the fluid formed is but one of its sequelæ. Here at once is a reason why operations upon tubes thus enlarged are not always and at once successful in curing the patient of all disability.

I am at present making daily visits to a patient operated upon in the Spring from whom a large hydro-salpinx was removed, along with the ovaries and tube of the opposite side. Her uterus and structures lateral to it are now free from all sign of disease, but there still linger low down in the pelvis foci of inflammation in the cellular tissue, which, although objectively small, cause a disproportionate distress to the patient. The operation was here an imperatively necessary step, but still only one step on the road to cure.

Hydro-salpinx is at times associated with anomalies in the development of the individual: thus I operated last week in Chicago on a married woman about thirty-eight, who had been a great sufferer ever since puberty. I found an infantile uterus, two very small white ovaries, that on the left side being no larger than, and of the shape of, my thumb nail, while vaulted over it was a large tube distended by several ounces of watery fluid. The indication in this case was not the size of the tube, but the establishment of the menopause to relieve painful ovulation. In pyo-salpinx, on the other hand, the starting-point and focus of the disease are often the intensely poisonous contents of the tube, which involve surrounding structures by successive invasions; and here, were it practicable, the disease might often be cured by removing the tube alone, leaving the ovary; but of such conservatism I do not approve, as the ovary without its duct is useless, even dangerous.

Of *hæmato-salpinx* I will not speak further than to say emphatically, that I do not believe that all these cases are extrauterine pregnancies, and to draw attention to the fact that the contents of the sac

may be as acridly poisonous as that of pyo-salpinx, and should receive the same extreme care in removal.

It would be better if PAIN, *per se*, were never considered a sufficient indication for operation; or, at the worst, only those cases operated upon in which the most prolonged and painstaking care had failed to relieve, and where the intensity of the suffering must always seriously interfere with the capacity of the patient to enjoy life. We here meet the neurologist on common ground, and it would be better for all such cases if they first underwent a prolonged treatment at the hands of these specialists. A host of cases of neuralgic ovaries which have been sacrificed by gynecologists would thus have been cured, and many cases which have been operated upon and not relieved would at least have been spared the ordeal of operation, and the too frequent reproach thus be spared the gynecologist, that he recommended the removal of a woman's ovaries, but she declined and a nerve specialist afterward cured her, and, to make the reflection worse, she has since borne a child.

I have a case in which a good friend considered removal of the ovaries would be necessary some two years ago, so great were the patient's sufferings, but with the gradual compensating hypertrophy of an insufficient mitrally diseased heart, she has improved and is now six months pregnant.

A prominent factor in causing this pelvic distress especially aggravated at the menstrual period, is, I am now convinced, large varicose veins in the broad ligaments.

I think I can almost always recognize these cases now by the character of the pain, the facies of the patient and a peculiar sense of boggy fulness to the vaginal finger. Constipation seems to be one factor in the causation, but while relieving constipation helps the condition I have not found that it cures any case of long standing. Sequelæ of pregnancy may cause it. My experience as an operator leads me to reject removal of tubes and ovaries as in any way assisting a cure. In one case sent me by one of the most prominent neurologists in the country last spring, the patient is but little improved, although one of the veins tied and cut off was a half centimetre in diameter. As nothing else seems to do more than mitigate this condition, I propose yet to open the abdomen and simply tie the distended tortuous veins at either end, aspirating then, if necessary, and if the patient is no better she will at least be no worse off.

One class still remains, usually classed among the neuralgic cases, and this class Dr. S. Weir Mitchell has happily defined, giving appro-

priate form to an idea which I have for some time entertained, they are those cases in which the expectancy and concentration of the attention on a normal function leads it to simulate disease in the expression of pain.

These cases if operated upon rarely reflect credit upon the operator, and should ever be considered more in the province of the neurologist than of the gynecologist. I have never operated on a case of this sort, and never expect to.

We have here been speaking somewhat briefly of cases in which pain is the only local manifestation of disease. There is a small group of cases in which general nervous phenomena of an aggravated character seem after a time to subside into a local disease. I have in mind a case of salaam convulsions which lasted many months, was followed by severe neuralgic pains in various parts of the body, then by severe pelvic pains, and at the operation small cystic ovaries were discovered, and the patient promptly and completely cured by their removal. It is impossible, however, for any but a specialist to distinguish with certainty between those cases in which there are no manifest gross changes in these organs, and the cases about to be described, in which the trained touch can with certainty and exactitude determine the nature and extent of such changes. I know by my own progress in this matter how impossible it is for any but the touch, which is daily exercising, improving, and correcting its inferences, to come to any definite conclusions in this matter, as to the size and position of the ovary and tube; whether cystic, how much enlarged, and if adherent. All these and other questions are but matters of daily practice for years to decide in all cases.

One of these cases I show you to-night (Mrs. J.) was treated by upward of thirty physicians, and had received almost as many differing opinions, no one recognizing the true nature of her disease, which I had the satisfaction of determining at once to be abscess of the ovary, the instant my finger swept over the vault of the vagina.

Another patient was treated for fourteen years, and her physician, who lived in central New York State, recognizing some similar symptoms in a case upon which he saw me operating at my private hospital, sent her down to me, and she is now very much in the improved condition of the patient you have just seen. Here also I removed ovaries greatly enlarged by old encysted abscesses.

Briefly then, as to the status of this operation—the removal of *diseased* appendages, small in size, but in which pain is a prominent symptom—as a scientific operation.



1. It is scientific, because it deals with *diseased organs*.

2. It does more than almost any other single surgical procedure in relieving a large number of cases whose sufferings have been almost unbearable.

3. In *properly* selected cases the percentage of recoveries is over ninety-five per cent., and improving, and the percentage of cures equally large.

4. Unless we adopt the yardstick as our measure of disease, the indications for operative interference are often more urgent than in the case of most cystomata coming under our observation.

And lastly, all the steps of the operation, the technique of the procedure, have now been so widely appreciated, that it may be described as a *safe* operation.

In marked contrast to this statement might be cited the case of Sir Spencer Wells, in the days when this operation was in its infancy. We can here readily discover one reason why Sir Spencer has always been so bitterly opposed to operations of this class. He operated upon a woman fifty years of age, for the purpose of inducing the menopause. In opening the abdomen the intestine was cut, the ovaries were not completely removed, and the mesentery prolapsed from the wound, and a bad hernia followed. Such was the result of an imperfect technique in the hands of one who in the generation past did more for abdominal surgery than any other man of his time.

Of all questions relative to this work, that of *results* most nearly concerns us. As to the *immediate* result, life or death, I will speak of that under the title of Danger of the Operation.

I refer here to the result relative to the *curing of the disease* in those cases which have recovered from operation. A satisfactory inquiry upon this heading will depend entirely upon the standard which we erect beforehand by which to test our results.

The brilliant results occasionally following this operation, and the many sanguine reports of operations in which the patients are reported to have been the most wretched of all sufferers, and by the abdominal section to have been at once and forever relieved from all pain, to have recovered health at once, and been able to return often to duties of a very laborious nature, have conspired to bring about such a state of professional opinion that cases which cannot show these results are thrown back upon the operator as failures.

There was at one time, when this operation was dangerous, as in that cited by Sir Spencer Wells above, some reason for this opprobrium, and the results gained were measured by the danger passed

through, and often found inadequate, but with the great diminution of the danger the whole status of the question has altered. My own standard is this :

Are the organs diseased? Will their removal cure the patient entirely, or will it relieve a large part of the suffering and at least make life more bearable. A result *absolutely* good is always to be desired; but a result *relatively* good is something to be very thankful for, and grasped in many cases. Not only the general profession but gynecologists themselves are apt to place all hope upon the operation, like a throw of dice, and to forget that it is often more rational to handle the cases from the beginning of their treatment to the end, in such a manner that the operation is viewed by doctor and patient as simply a *step*, at times the only one, again the most important step, or occasionally but one in the flight, in the treatment and progress toward cure.

Cases often require after-treatment, and some of my cases have only left me entirely well after weeks more of work. My operation removed, it is true, the focus of the disease, without which I could never have made any progress, but my after-treatment dealt with the disease products which may have been accumulating for years, the embers, ever freshly kindling so long as the diseased tube and ovary remain, but now readily yielding to treatment. In other cases, I have been actually obliged to deal with disease of my own creating, for in three cases I have treated the women for cellulosic deposits formed, I believe, around the ligature at the stump.

Since my return from Europe on September 7th, I have operated upon fourteen cases of abdominal tumors, including hysterectomy and pyo-salpinx. The last case is too recent to speak of, but not one of the others developed any fever after the operation, owing to my careful attention to the principles of antisepsis. A neglect of antiseptic precautions is criminal in any form of surgery. But this may be carried out with nothing but soap and water. The development of an antiseptic conscience is the chief point.

A simple transfixed ligature can readily rotate on its point of perforation, releasing the tissues and allowing secondary hemorrhage. To avoid the retraction of the tissues through the ligature great care must be taken not to cut close to it. One serious error is cupping the stump, which should rather have an hour-glass form.

Dr. Dudley, of Chicago, uses a knot of his own invention, which I like best of all for most of these cases. It is made by entering the needle, with a double ligature, through the broad ligament, carrying it

across, and reintroducing, bringing it out on the same side on which it entered. The needle is removed and the loop carried over the whole mass to be tied off and laid between the free ends of the ligature. This is grasped in the thumb and fingers and drawn up tight, then one end is handed to an assistant while the other is pulled tight, and next the other end treated in the same way, and in the same manner it is tied.

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## DISCUSSION.

DR. JOHN C. DAcOSTA said: Believing that many unnecessary operations are done, and that it is better practice to cure a woman and leave her with her organs intact, rather than by a brilliant operation to unsex her, without the certainty and with only the hope of relief, I took decided ground at the last meeting of this Society, in November, against the great number of abdominal sections now being made, including those made for "pain alone" (which is the subject for this evening's discussion), citing these cases to sustain my argument, viz.:

First. That a large proportion of the operations as done, and for the reasons alleged for operating, are unjustifiable.

Second. That the published reports of many cases said to be cured by operation are unreliable. For though the operator may have been honest in thinking when he made his report that he had cured his patient—the after-history of the case sometimes showed failure.

Third. That the spaying of women for pain alone, and for many of the other supposed causes of trouble for which it is done, and in the miscellaneous way in which it is done, is unwarranted.

Having argued these points fully at the meeting a month ago, I this evening only restate my heads of argument, leaving the discussion to those gentlemen who have not yet had the opportunity to express their ideas.

DR. W. H. PARISH said: Twenty years ago very little was taught of the diseases of the tubes, and of any but the more bulky diseases of the ovaries. More recent experience and more recent literature are teeming with abundant evidence that diseases of the appendages, and more especially of the tubes, are of really the greatest frequency. Most usually the affliction is inflammatory in character, and dependent upon catarrh, gonorrhœa, or sepsis. I wish the readers of the papers had spoken of the prevention of these affections, and especially of the means of preventing inflammatory tubal and ovarian disease reaching that stage in which removal by surgical skill is indicated. The duty of the day is to point out the means of prevention rather than to permit professional interest to continue centered in the operation of removal. At the time when removal of the appendages is justifiable, sterility has been already established by the disease itself, and such treatment as will obviate that stage of progress of the disease which indicates surgical interference, will also tend to lessen the probability of the establishment of sterility. What is to-day a mild inflammation of an appendage, is liable—it may be very quickly—



to become a condition even threatening life, and I am confident that some of the measures to-day, directed by many against associated vaginal or uterine inflammation, do frequently aggravate greatly a latent and subsiding salpingitis and ovaritis. Too irritating an application to a gonorrhœal endometrium will certainly convert a quiescent inflammation of the tubes into a pus-forming salpingitis. The same is true in reference to applications made in other forms of endometritis. Gonorrhœa is the most important cause of dangerous salpingitis. The German writers pronounce the catarrhal form of most frequent occurrence, but they find this form most common in prostitutes, and we are most likely to assume, and correctly, that the disease in the prostitute is of gonorrhœal origin.

Hæmato-salpinx often endangers life, inasmuch as rupture of a tube containing such altered blood as is found in that affection may originate fatal peritonitis. Now one of the causes of hæmato-salpinx is stenosis by narrowing or by flexion of the cervical canal—securing the patulency of that canal may permit the tube to empty itself gradually into the uterus, just as it does after opening up the vagina or uterus in hæmato-metra and hæmato-colpos. The inflammatory cases of tubal and ovarian disease are divisible into three groups: one of mild character, on which probably no one would operate for removal; another group, in which the accumulation of pus is so large, and the symptoms so grave that, probably, all operators would agree as to the necessity for removal; and then there is an intermediate group, in which surgical opinion would be at variance as to the propriety of removal. In this group the tubes and ovaries are in a condition of more or less subacute or chronic inflammation, with extensive adhesions, and probably some cystic degeneration. Physical examination does not always in these cases clear up the indications. The environments of the patient, the symptoms and the progress of the case after prolonged judicious treatment, must as yet decide the question.

When, after removal of the inflamed appendages, the relief is not complete, or it may be there is no relief, the explanation is to be looked for often in the incomplete character of the removal—a portion of the tube, especially the uterine portion, or a portion of the ovary has been left, and this becomes the focus of other trouble.

There are sins of omission as well as of commission in reference to this operation, and I believe that the profession has even yet more of omission than of commission resting on it. I am not an extremist, and have not operated for removal of the appendages many times.

DR. WM. S. STEWART said: I belong to the conservative class. Battey's operation is not a good one in general. There is danger in operating *per vaginam*. In one case we had a hernia. In one case I succeeded in passing a small sound up into a large abscess (of the left tube), and recovery ensued after discharge of pus through the uterus. Those cases in which failure to give relief to pain is most evident, are those in which we are most justified in operating (as the results afterward prove). In one obstinate case in a single woman, with hypertrophied ovaries, and obliterated tubes, the patient was slow in recovering, but has at last reached a comfortable state. She was an intolerable sufferer; internal medication, either by mouth, rectum, or hypodermically had little or no effect. Relief promptly followed removal of the ovaries.

DR. E. L. DUER said: I think this Society can endorse these papers as representing the advanced state of knowledge on these points. Dr. Kelly has emphasized for us the advantage of the educated touch. Dr. Coe, of the Woman's Hospital, of New York, states that but one-fifth of the ovaries removed are diseased. Pain is such a prominent symptom that it can hardly be called a neurotic manifestation; it is often due to adhesions or to pressure, excepting in cases of gonorrhœal origin, or pus-containing tubes. This question has resolved itself to me into one of environment. The poor woman who must keep up and at her work, has no relief but by the knife. The rich woman who can be cared for, with rest, and favorable surroundings may be relieved, sometimes, for example, by the patient and persistent stretching of adhesions and restoring the circulation of surrounding parts.

DR. J. PRICE said: It has been our custom to operate only for diseased tubes or ovaries, and we always find disease. Perhaps we cannot say that it will be abscess or pus, but it is always disease. I do not believe that it is possible to diagnose everything until the abdomen is open. Dr. Emmet says: "It has been held that, as a rule, little evidence of previous cellulitis can be found when operating for the removal of Fallopian tubes," and that his experience confirms the accuracy of this observation. This has not been my experience. The adhesions have always been quite general, when operating for disease only.

Dr. Kelly refers to hemorrhage, and Dr. Wilson to sepsis. Dr. Martin talks more about sepsis than any other operator, and his details of antiseptic precautions are quite elaborate. His mortality of twelve in seventy-two would stay Mr. Tait's hand. It is time to put this question in proper shape lest some good man be held criminally responsible for wisely and reasonably avoiding these solutions and dressings so highly lauded. We will take the statements of prominent operators. One is that "unless chemical or antiseptic solutions are used, the operator will be held criminally responsible." Another, that "men operating without solutions, is recklessness bordering on criminality." The opinion and practice of the skilled members of the profession will be incorporated in and make the law governing all cases.

Prof. Leopold has 110 completed ovariectomies—four died of septic infection (three and six-tenths per cent.), and he uses solutions. I believe that the great danger is from hemorrhage, not sepsis. The ovary and tube should be delivered, and this leaves but a small stump to be tied. I am not in favor of operating except for disease. We would not trephine for clavis hysterics, or take out the eye for the agonizing pain complained of the next day—by the same patient who wants her ovaries removed for abdominal pain. We hear a great deal now of imperfect operation, necessitating a second operation. Mr. Tait and Dr. Keen have reported cases in which they performed operations, after others had attempted them and left them incomplete.

DR. W. SINKLER said: The operation of removal of the ovaries is of great interest to neurologists, because many of the cases of hysteria and nervous prostration which come under their care, are connected with pelvic pain or dysmenorrhœa. Besides Chareot's observations in hystero-epilepsy, relieving the paroxysm by pressure over the ovaries would seem to indicate that in such cases a cure might be expected from removal of the ovaries. The result of the operation, however, although satisfactory in some, is disappointing in a great many cases of this character.

I have had under my care quite a number of patients in whom the ovaries had been removed for hysteria, neurasthenia, pelvic neuralgias, etc. One case, about twenty-three years of age, an extreme case of hysteria and a persistent masturbator, was under my charge at the Orthopædic Hospital and Infirmary for Nervous Diseases. After seven months, being unimproved in every respect, she was discharged, and was taken by her friends to another hospital, where her ovaries were removed. After a few months she again came under my care, and I found her in as bad a condition as ever. The hysteria was as marked, and she masturbated very often. She did not improve in my hands, and I have recently heard of her after an interval of nearly three years, in a worse state than ever before.

Another case, is a lady of forty-two years, who, three years ago, had the ovaries removed for dysmenorrhœa, pelvic distress, and general neurasthenia. After a course of rest treatment she has improved greatly; but it is an interesting fact that she still has attacks in which she says there is a sensation of uterine contraction and pressure, just as there was before the operation.

In conclusion, while I would hesitate to recommend removal of the ovaries for the relief of pelvic pain alone, I have no question in my mind that there are many cases of hysterio-epilepsy and extreme neurasthenia dependent upon violent and prolonged dysmenorrhœa or ovarian pain, in which it seems to me that the operation is not merely justifiable, but is decidedly indicated.

DR. CHAS. K. MILLS said: The ground taken by Dr. Kelly can scarcely be attacked if, as I understood him, operation should be only undertaken in the first place, when local disease can be clearly made out, and, in the second place, such disease can nearly always be recognized by proper methods of examination. Certainly, however, in very many cases of pelvic pain, no disease of the ovaries, tubes, or uterus can be recognized, or, indeed, is present. We have true neuralgias of these organs as we may have of any viscus. Before too much significance be given to the ovarialgia of Charcot, it should be recalled that even in male hysteria, pain in one or the other iliac region has been met with in a number of reported cases. As to the view expressed by Dr. Wilson that operation is sometimes called for when hysterio-epileptic and other morbid phenomena are exhibited at or near the menstrual period, we should hesitate in accepting this dictum. All nervous symptoms are likely to be aggravated or excited in neurotic women at the menstrual period. In the *American System of Practical Medicine*, I have reported two cases of hysterio-epilepsy in which the operation of oöphorectomy was performed. In one of these cases clitoridectomy was also performed. The hysterio-epilepsy was not cured in either case. My conclusions are given in this work as follows: "With reference to oöphorectomy for hysterio-epilepsy or any form of grave hysteria it may be concluded: 1. It is only rarely justifiable; 2. It is not justifiable in the case of girls who have not menstruated; 3. When disease of the ovaries can be clearly made out by local objective signs, it is sometimes justifiable; 4. It is justifiable in some cases with violent nymphomania; 5. The operation is frequently performed without due consideration, and the statistics of the operation are peculiarly unreliable."

We have few reliable statistics with reference to the performance of pelvic operations for the relief of insanity. In these days, when operations are talked about in every house and almost on every corner, cases of ovarian monomania



are likely to be met, cases in which the women are determined to be operated upon whether or not; some of these cases are undoubtedly like those of sexual hypochondria or monomania in man, in some of which self-castration is performed. In the wards of the Insane Department of the Philadelphia Hospital is now a patient who has removed both testicles by successive operations, under the influence of such a monomania. Operation upon the ovaries or tubes, or both, in cases of insanity should be restricted to those cases in which either local disease of long standing can be made out, or in which the outbreak of insanity can be clearly traced to disease or impaired function of these organs.

DR. KEEN said: In relation to hemorrhage, one little wrinkle may be of value. I have never had the ligature to slip from the pedicle, and this, I believe, to be due to the employment of this method. I pass the double ligature as usual, cut it in half, tie each half of the stump, and then, without cutting the ends, treat each ligature as follows: I thread one end through a needle and transfix the tissue near by by this end, and tie a second knot. This fixes the ligature in place so that it is impossible that it shall slip.

DR. M. PRICE said: There have been complaints of fistula lately—which may be due to imperfect method of introduction of the drainage tube. We usually introduce it well down into Douglas's pouch, well below the bowels. When there has been pus, we believe it to be necessary; if there be little oozing we remove it after a day or two, but otherwise retain it as long as necessary, and have never had occasion to regret it. I do not see what there is to fear.

DR. KELLY said: The cases cited by Dr. Sinkler and Dr. Mills have a direct bearing upon my remarks, and show how important it is that the gynecologist should frequently seek the counsel of the neurologist.

In reply to Dr. Price, I would state that a neglect of antiseptic precautions is criminal. The Society will not, however, understand me by this to refer in any way to a use of *solutions*, but to the antiseptic conscience, which is the creation of this generation, and in abdominal surgery often does its work as well with soap and water. Dr. Martin, of Berlin, does not operate in a tiled room, and never subjects his visitors to any applications.

The obstetric pad which I described, has long been in use at my hospital, and I know of nothing antedating my use of it. Extensive follicular degeneration of the ovaries never, *per se*, requires operation, but this is often made necessary by the associated symptoms.

All my cases have been benefited, while several continue to suffer from pelvic pain, they are entirely freed from the menstrual exacerbations, most have been raised up from chronic invalidism to perfect health, one attaining this not earlier than a year after the operation. In a case of epilepsy with most marked menstrual exacerbations and severe ovarian pain, the epileptic attacks continue, but she is free from pain, and Dr. Kerlin, under whose charge she now is, considers her improved.

# A SUCCESSFUL CYSTOTOMY AFTER FAILURE OF SUCTION TO REMOVE A PIECE OF A CATHETER FROM THE BLADDER.

By W. W. KEEN, M.D.,

PROFESSOR OF SURGERY AT THE WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA ; SURGEON TO  
ST. MARY'S HOSPITAL, ETC.

[Read December 28, 1887.]

THE recent suggestion of Dr. De Forest Willard (*The Medical News*, November 26, 1887) and Reginald Harrison (*Lancet*, Oct. 29, 1887), to extract foreign bodies from the bladder by the rubber bulb and evacuator of Bigelow's litholapaxy instrument, makes a valuable addition to our surgical resources in these troublesome cases, and is my especial reason for bringing to your attention to-night the following case. The failure of the method in this particular instance was due to special reasons.

J. W., a healthy man, aged seventy-five years, living in Elkton, Md., had suffered for a considerable time with recurring retention of urine, and eystitis following an enlarged prostate. Dr. Charles M. Ellis, his attending surgeon, very wisely taught him the use of the catheter, which he has employed daily for some months. The Nélaton catheter (No. 22 French), which he has employed, having lost its rigidity, he whittled a pine stick to the necessary size, and sought, by means of this, to introduce it into the bladder, November 7, 1887. In the attempt the catheter broke, and a piece, subsequently ascertained to be  $4\frac{1}{2}$  inches long, broke off and passed into the bladder. Severe pain and retention followed immediately, and persisted until after I operated upon him. Dr. Ellis, having failed in his efforts to extract the fragment, sent him to me, as the surroundings at his home were most unfavorable for any operation.

Three days after the accident I made repeated unsuccessful efforts at extraction with forceps and lithotrites. I was not even able to detect the fragment.

On November 11th and 13th I attempted to remove it by suction with Bigelow's evacuator. On the last occasion Dr. Willard kindly helped me personally. We repeatedly filled the bladder with warm boiled water, being careful to keep the extremity of the evacuating tube just at the vesical extremity of the

urethra, but suction had no effect in engaging the fragment. This was amply explained later by finding that it lay crosswise, and was so long that both ends were held fixed by the walls of the bladder, while the relative rigidity of the short fragment prevented any possibility of its being brought to the opening of the evacuating tube, though we sought for it through the tube with Dr. Willard's forceps. An evacuating tube with a lateral eye gave no better results than one with an opening at the end. I also used a rectal bulb filled with seven ounces of warm water, but all to no purpose.

After debating between suprapubic and lateral cystotomy, I decided upon the latter, in consequence of the observation of Harrison and others, that the prostate sometimes shrinks after perineal cystotomy, when a tube is retained in place for some time. Accordingly Dr. Wm. J. Taylor etherized him, and I did left lateral cystotomy with a staff. The operation presented nothing unusual. The prostate was markedly enlarged in its lateral lobes, so that I was barely able to get my finger into the bladder. With the ordinary lithotomy forceps I easily seized the fragment by the middle, removed it, and introduced a rubber drainage tube with a flange, by which it was easily retained in place by tapes. The patient's temperature never rose above 99°, and in six days he went home, with my instructions to retain the tube in place for two months, and then to remove it and allow the opening to heal. By this means I hoped to be able to avoid the necessity for the subsequent daily use of the catheter.

December 15th, after nearly five weeks retention of the drainage tube in the bladder I found that, owing to his feebleness, want of care and cleanliness, the tube was proving a source of irritation and slight suppuration. Accordingly, December 16th, I removed the tube. In three days the wound closed sufficiently to cause him to void his urine by the urethra, and he was no longer obliged to rise at night to relieve the bladder. The prostate has shrunk to some extent, so that he no longer needs to use a catheter. Whether this will be permanent, or is only temporary, time alone will determine.

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## DISCUSSION.

DR. J. H. PACKARD said: I have listened to Dr. Keen's account with much interest, and merely wish to call the attention of the Society to the value, in some of these cases, of the suprapubic operation. This is not taught in the schools, and is scarcely mentioned in text-books, except, perhaps, in the way of condemnation. While not an advocate of this procedure to the exclusion of others, I feel that it has been greatly undervalued, and allowed to fall into undeserved neglect.

Especially in cases of foreign bodies, and when a long article is placed crosswise, there may be difficulty in extraction through a perineal opening. Sometimes, either in these cases or in those of stone, such violence is inflicted upon the vesical wall as to increase materially the risk to the patient. I have seen instances in which I could not but think that a fatal result was largely due to this cause.

As a rule (to which I know of but one recorded exception), the injection of



seven or eight ounces of water causes the bladder to bulge up the peritoneum, being lifted away from it so as to afford abundant space for direct entry into the vesical cavity. Through the opening thus made, the finger can be introduced and the cavity explored. After the removal of the offending body, the wound can be sutured, except just where the drainage tube—which I have always employed—is passed in. Through this tube the urine flows away freely.

When infiltration of urine occurs, it is, in my opinion, almost always due to the fact that the incision being made at a point too low down, the contraction of the emptied bladder brings the opening just behind the symphysis; the urine is thus obstructed, and finds its way through the meshes of the areolar tissue.

Diminution in the volume of the prostate occurs after the suprapubic section, just as Dr. Keen states it takes place after the perineal operation. I could cite four or five cases in which I have noted this; it would seem to be due to the relief of pressure and the cessation of straining.

DR. KEEN said: In this case I had to deal with a known flexible body, and so there was no trouble in the case. But had it been a rigid body, I would have done a suprapubic operation.

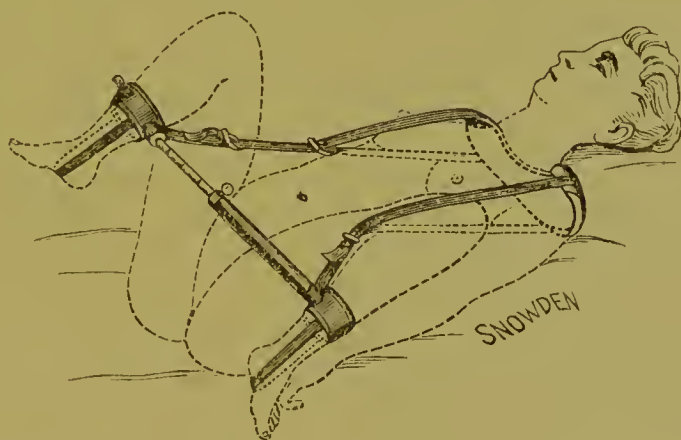
# A MODIFICATION OF THE "PERINEUM DISTENDER" TO AVOID ITS INTERFERENCE WITH RESPIRATION.

By W. W. KEEN, M.D.,

PROFESSOR OF SURGERY AT THE WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA ; SURGEON TO  
ST. MARY'S HOSPITAL, ETC.

[Read November 28, 1887.]

IN the frequent use of the "Perineal Distender," I have found the strap which passes under the nape of the neck very objectionable. This strap flexes the legs, and supports their weight. While doing so the weight of the legs pulls the head and neck strongly forward, and thus often seriously embarrasses the respiration.



To avoid this, I have had the wooden shoulder-piece of the old Day's apparatus for fracture of the clavicle slightly shortened, and find it answers admirably. Under its loops, over each shoulder, two straps are passed with a buckle turned wrong side foremost at one end. The other free end, after passing through this buckle in the armpit, then is buckled to the cross-piece between the legs. By this means the pressure is brought on the shoulders instead of the neck, and respiration is entirely unimpeded.

I have also had two straps attached at right angles to the straps for the legs. By this means the leg-straps can be secured above the calf as usual or at the ankle. In this last position the new straps, by passing under the foot-soles, more completely flex the legs, and get the feet out of the way of the operator.



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